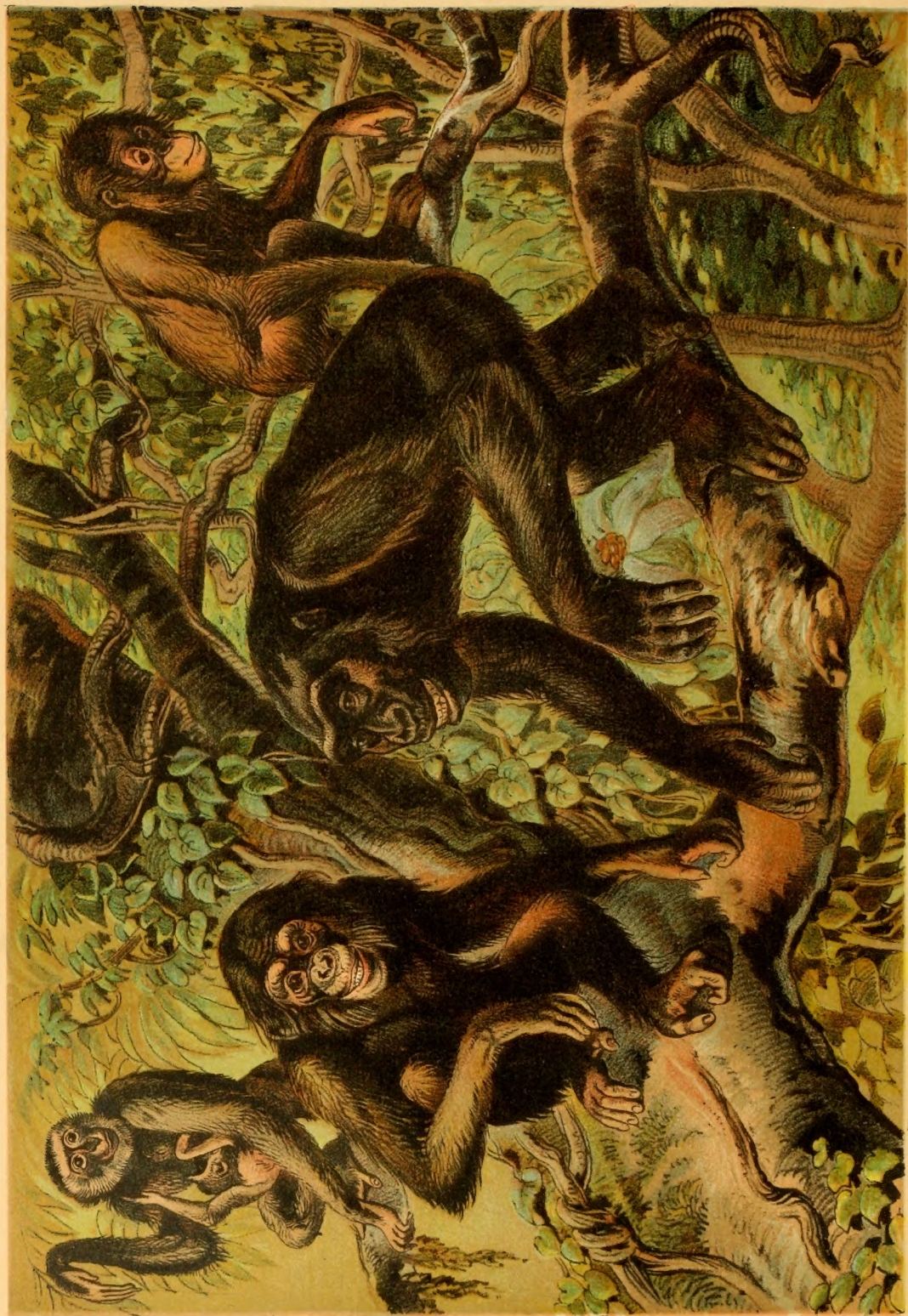


ANIMAL
KINGDOM
VOL. I.

L-6

235
por U



ORANG-OUTAN

GORILLA

HULLOCK GIBBON CHIMPANZEE

PLATE I. QUADRUMANA.

Q2
703
C88
v. 1
MAMM.

... THE ...

ANIMAL KINGDOM

Based upon the Writings of the Eminent Naturalists,

AUDUBON, WALLACE, BREHM, WOOD, AND OTHERS

.... Edited by

HUGH CRAIG, M. A.,

Trinity College, Cambridge.

... WITH ...

SIXTY-FOUR FULL-PAGE ILLUSTRATIONS

Accurately and Beautifully Executed in

EIGHT COLORS AND TINTS.

VOLUME ONE.

NEW YORK:

JOHNSON & BAILEY,

114 and 116 Nassau Street.



Copyright, 1897, by Charles F. Johnson.

WEED-PARSONS PRINTING CO.,
PRINTERS, ELECTROTYPERS AND BINDERS,
ALBANY, N. Y.

*To the Lovers of Nature and Nature's
works, this account of the friends and servants,
the foes and scourges of mankind, is respect-
fully dedicated by the Author.*

PREFACE



THE work which the publisher now offers to the public is intended to be instructive as well as entertaining, accurate as well as popular. A knowledge of zoology can be imparted without the use of technical language; in fact, the conventional vocabulary must be in great part discarded by any one who seeks to address the general public rather than a select band of scientific students. And it is to the general public, to our clergymen, our men of business, our workingmen, and especially to our young people, that this Natural History is dedicated. In a work with such an aim, a formal inventory and technical description of the manifold forms of animal existence would be evidently out of place; instead of investigations of the lifeless organism there must be accounts of the living creature; instead of scientific terminology there must be language plain, clear, and direct; the information which the volume seeks to impart must be conveyed in a manner easy to comprehend, easy to remember, and generally attractive. To the attractiveness of this work the numerous beautifully-colored plates with which it is illustrated contribute in no ordinary degree. The designs are original and have been prepared at unusual expense. They represent in a more vivid and striking way than mere words can depict, the shape, the habits and the habitations of the animals, as well as the colors with which Nature has adorned them and the attitudes which most distinctly characterize them.

JOHNSON'S HOUSEHOLD BOOK OF NATURE aims, as has been said, to be interesting. It is hoped, however, that it will be more than a mere readable book of entertainment, and that it will not allay, but stimulate

curiosity, and invite to a deeper and further study of the wondrous works of Nature. In this hope there have been added the technical names of each order, genus and species.

It does not require to be pointed out how fascinating a study Natural History in all its branches must ever be, or what a perpetual source of interest can be found in observing the forms and habits of the living creatures which meet our view whatever portion of the world we visit. Still more interesting and more instructive must be a knowledge of that class of Animated Nature to which man himself belongs, and which contains such friends of man as the dog that guards him, the horse that labors for him, the ox that supplies him food, and the sheep that furnishes him with clothing; till man had brought these under his dominion, how inconceivably helpless he must have been! No less instructive is it to note how the lower animals differ from or resemble Man, the crown of Nature's work; how admirably each species is adapted for the location in which its lot is cast, and for the uses it has to fulfil in the economy of the world; how marvellously they are endowed with power and grace and beauty.

Especially in the present day is a knowledge of the elements of Natural History a necessary part of our education. This work claims to minister to the educational wants of all classes, and therefore carefully avoids discussion of unsettled points, and states nothing but incontrovertible facts.

The order in which the various genera of the Mammalia is placed has been adopted in accordance with the most eminent authorities.

The first two chapters are devoted to an account of the system of classification of the Animal Kingdom, and therefore may prove less interesting to many readers than the following chapters, in which the different genera and species are described, and in which there is more of living interest and entertaining narrative.

HUGH CRAIG.

CONTENTS OF VOLUME ONE.

MAMMALIA.

CHAPTER I.

Inanimate and Animated Nature (1)—The Mineral (1), Vegetable (2), and Animal (3) Kingdoms—Classification of Animals (4)—The Vertebrates (4)—Classes of Vertebrates (5).

CHAPTER II.

The Class Mammalia (6)—General Characteristics (7)—The "Dental Formula" (8)—Division into Orders (13).

QUADRUMANA.

CHAPTER III.

GENERAL CHARACTERISTICS.

The General Characteristics of Quadrumana (17)—Their Habits in their Native Haunts (18)—Their Gregarious Disposition (20)—Division of the Quadrumana (22).

CHAPTER IV.

THE ANTHROPOID APES.

The African Division (23)—The Genus *Troglodytes* (23)—The Gorilla (23)—The Chimpanzee (27)—The Asiatic Division (32)—The Genus *Simia* (32)—Orang-Outan (32)—The Genus *Hylobates* or Gibbon (35).

CHAPTER V.

THE OLD WORLD MONKEYS.

The Long-tailed Monkeys (41)—The Genus *Semnopithecus* (41)—The Proboscis Monkey (44)—The Douc (45)—The Genus *Colobus* (45)—The Guereza (45).

CHAPTER VI.

BABOONS AND MACAQUES.

The Family *Cynopithecidae* (47)—The Genus *Myiopithecus* or Talapoin (47)—The Genus *Cercopithecus* (47)—The Guenons (51)—The Genus *Cercocebus* or Mangabeys (52)—The Genus *Theropithecus* or Gelada (53)—The Genus *Cynocephalus* or Baboon (54)—The Baboon Proper (56)—The Chacma (58)—Its Use in Finding Water (58)—The Sphinx (60)—The Hamadryad (61)—Its Pugnacious Disposition (61)—Disgusting Character of the Mandrill and Drill (62).

CHAPTER VII.

BABOONS AND MACAQUES.—*Continued.*

Genus *Macacus* (63)—The Common Macaque (65)—The Bonnet Ape (67)—The Rhesus or Bunder (68)—The Lapander (103)—The Wanderoo (71)—The Magots (72)—The Gibraltar Monkeys (72)—Genus *Cynopithecus* (74)—The Black Baboon-ape or Celebes (74).

CHAPTER VIII.

THE NEW WORLD MONKEYS.

The American Monkeys or Cebidæ (75)—The Genus *Cebus* or Sapajou (77)—The Genus *Lagothrix* (80)—The Spider Monkeys (81)—The Genera *Ateles* and *Eriodes* (87)—The Howling Monkeys (85)—The Sakis (89)—The Night Monkeys (92)—The Tee-tees (94).

CHAPTER IX.

THE MARMOSETS.

The Marmosets or Ouistitis (95)—The Family Hapalidæ (97)—The Genus *Hapale* (97)—The Silky Marmoset (98)—The Pinche (98)—The Dwarf Marmoset (98)—The Genus *Midas* (99)—The Sagouins (99).

CHAPTER X.

THE LEMUROIDEA.

The Indris (102)—The Lemurs (104)—The Ruffed Lemur (105)—The Cat Lemur (106)—The Hapalemur (107)—The Cheirogaleus (108)—The Loris (110)—The Tarsier Spectre (114)—The Aye-aye (115).

CHEIROPTERA.

CHAPTER I.

GENERAL CHARACTERISTICS.

The Order Chiroptera (121)—Superstitious Dread of Bats (122)—Their Usefulness (122)—Their Flying Apparatus (124)—Their General Characteristics and Habits (124)—The Genera of the Order (127).

CHAPTER II.

THE VAMPIRES

The Fruit-eating Bats or Flying Foxes (129)—The Kalongs (129)—The Leaf-nosed Bats or Vampires (130)—The Horseshoe Bats (134)—The Rhinopoma (136).

CHAPTER III.

THE TRUE BATS.

The Common Bat (137)—The Taphozous (138)—The Pipistrelle (138)—The Barbastelle (139)—The California Bat (140)—The Great Bat of Britain (140)—The New York Bat (141)—The Carolina Bat (141)—The Hoary Bat (142)—The Long-eared Bat (142)—The Big-eared Bat (142)—The Noctilionidæ (143)—The Genus *Nycticeius* (143)—The Genus *Nyctinomus* (144)—The Genus *Noctilio* (144).

INSECTIVORA.

CHAPTER I.

THE FLYING LEMURS, ELEPHANT SHREWS AND PENTAIL.

Characteristics of the Order (147)—Its Division into Nine Families (148)—The Galeopithecidae (149)—The Flying Lemurs (149)—The Macroscelididae or Elephant Shrews (151)—The Genus Rhynchocyon (152)—The Genus Petrodromus (153)—The Tupaiadæ (153)—The Bangsring (154)—The Press (154)—The Genus Hylomys (155)—The Genus Ptilocercus (155)—The Pentail (155)

CHAPTER II.

THE HEDGEHOGS, MOLES, AND SHREWS.

The Erinaceidæ (157)—The Hedgehogs (158)—The Genus Gymnura (159)—The Centetidæ (159)—The Tenrec and Tendirac (161)—The Genus Solenodon (161)—The Agouti (161)—The Potamogalidæ (162)—The Chrysochloridæ or Golden Moles (163)—The Talpidæ (163)—The Moles (163)—The Genus Talpa (163)—Genus Condylura (164)—The Star-nosed Moles (165)—The Genus Scalops or American Mole (165)—The Genus Mygale (166)—The Desmans (166)—The Urotrichus (167)—The Soricidæ or Shrews (168).

CARNIVORA.

CHAPTER I.

CHARACTERISTICS OF THE ORDER.

The Carnivora or Flesh-eaters (173)—General Characteristics of the Order (173)—Its Function in the Economy of Nature (174)—Its Geographical Distribution (175)—Its Division into Families (175).

CHAPTER II.

THE LION.

The Lion (178)—Their Size and Strength (179)—Their Roar (180)—Their Habits (180)—Different Opinions of their Character (181)—Modes of Destroying (182)—The African Lion, the Cape Lion, the Gambia Lion, the Lion of North Africa (183)—The Asiatic Lion, the Maneless Lion (183)—Tame Lions (186)—Dangerous Pets (187).

CHAPTER III.

THE TIGER.

The Tiger (188)—Its Favorite Haunts (188)—Its Destructiveness (189)—Tiger Hunting (191)—Modes of Killing the Tiger (192)—Tame Tigers (194)—The Tiger in Ancient Times (195).

CHAPTER IV.

PANTHERS AND LEOPARDS.

The Cougar or American Panther (196)—The Jaguar (198)—Its Destructiveness (199)—A Tame Jaguar (200)—The African Leopard (201)—The Asiatic Leopard or Panther (202)—The Japanese Panther (202)—The Black Panther (203).

CHAPTER V.

THE OCELOTS AND THE CATS.

The Marbled Cat (205)—The Tiger Cats (205)—The Common Ocelot (205)—The Painted Ocelot (206)—The Syra (207)—The Chati (207)—The Long-tailed Cat (207)—The Pampas Cat (207)—The Clouded Tiger (208)—The Colocolo (208)—The European Wildcat (209)—The Manul (211)—The Malay Cat (211)—The Dwarf Cat (211)—The Egyptian Cat (212)—Letting the Cat out of the Bag (212)—The Common Cat (214)—The Marten Cat (215)—The Serval (215).

CHAPTER VI.

THE LYNXES AND CHEETAHS.

The Genus Lynx (217)—The Persian Lynx (217)—The Caracal (218)—The European Lynx (219)—The Booted Lynx (220)—The Canadian Lynx (220)—The American Wild-Cats (222)—The Genus *Cynælurus* (223)—The Cheetah or Hunting Leopard (224).

CHAPTER VII.

THE CIVET CATS.

The Cryptoproctidæ (226)—The Galet (226)—The Viverridæ (227)—The Civet (228)—The Zibeth (228)—The Genets (230)—The Pale Genet (231)—The Linsang (230)—The Hemigale (230)—The Binturong (231)—The Nandinia (231)—The Pougoune (231)—The Musang (231)—The Masked Paguma (232)—The Mampalon (233)—The Ichneumons (233)—The Mungos or Mangouste (234)—The Egyptian Ichneumon (235)—The Crab-eating Mangouste (237)—The Zebra Mangouste (237)—The Meerkat (238)—The Zenick (238)—The Mangué (239)—The Banded Mungos (239).

CHAPTER VIII.

THE AARD-WOLF AND THE HYÆNAS.

The Family Protelidæ (240)—The Aard-wolf (240)—The Family Hyænidæ (241)—Fables and Superstitions about the Hyæna (241)—The Striped Hyæna (242)—Two Tame Ones (243)—The Brown Hyæna (243)—The Spotted Hyæna or Tiger-Wolf (244)—Rapacity of this Species (244)—Its Horrid Laughter (245).

CHAPTER IX.

THE WOLVES.

General Description of the Genus *Canis* (246)—The Common European Wolf (247)—The Jackal Wolf (250)—The Kaberoo (250)—The Striped Wolf (250)—The American Wolves (251)—The Gray Wolf (251)—The Red Wolf (252)—The Coyote (253)—The South American Wolves (253)—The Crab-eating Wolf (254)—The Aguarachay (253).

CHAPTER X.

THE JACKALS AND FOXES.

The Jackal (255)—The Landjak (256)—The Common Fox (256)—The Racoon Dog (259)—The Corsac (260)—The Caama (260)—The Fennck (260)—The American Foxes (261)—The Red Fox (261)—The Silver or Black Fox (261)—The Cross Fox (261)—The Kid Fox (262)—The Gray Fox (262)—The Arctic Fox (262)—The Blue Fox (263)—The Large-eared Fox (264)—The Hunting Dog (264).

CHAPTER XI.

THE DOG.

The Wild Dogs (265)—The Dhole (265)—The Alpine Wolf (266)—The Domesticated Dog (266)—Regard in which the Dog is Held (267)—Abhorrence of the Dog by the Orientals (267)—The Dogs of the East (267)—The Dog in Antiquity (268)—The Mental Qualities of the Dog (268)—Its Moral Sense (269)—Its Affection for its Master (270)—Rabies or Hydrophobia (270).

CHAPTER XII.

THE SPORTING DOGS.

Modes of Classification (273)—Sporting Dogs (273)—The Scotch Greyhound (273)—The Irish Greyhound (274)—The African Greyhound (274)—The Common Greyhound (275)—The Hare Indian Dog (276)—The Italian Greyhound (276)—The Stag Hound (277)—Fox Hound (277)—Harrier (277)—Beagle (277)—The Otter Hound (277)—The Dachs Hund and Turnspit (278)—The Bloodhound (278)—The Pointers and Setters (279)—The Spaniels (280)—Springers (280)—Cockers (280)—Water Spaniel (280)—Chesapeake Bay Dog (281)—Retriever (281).

CHAPTER XIII.

SHEPHERD'S DOGS AND HOUSE DOGS.

The Shepherd's Dog (282)—The Colley (282)—The Spitz (283)—The Esquimaux Dog (283)—The St. Bernard (284)—The Mastiff (284)—The Thibet Dog (285)—The Bulldog (285)—The Newfoundland Dog (285)—The Black and Tan Terrier (288)—The Scotch Terrier (288)—The Skye Terrier (288)—The Yorkshire Terrier (288)—The Bull-Terrier (288)—The Fox Terrier (289)—The Coach-Dogs (289)—The Pug (289)—The Poodle (289)—King Charles (290)—Blenheim (290)—The Mexican Mopsey (291)—The Dingo, or the Dog Relapsed into Barbarism (291).

CHAPTER XIV.

THE WEASELS, OTTERS AND SKUNKS.

The Martens (293)—The Sable (294)—The American Sable (295)—The Black Cat (295)—The Polecat (295)—The Ermine (296)—The Ferrets (296)—The New York Ermine (297)—The Mink (297)—The Weasels (298)—The Wolverine (299)—The Otters (300)—The Canada Otter (301)—The California Otter (302)—The Sea Otter (302)—The Brazilian Otter (303)—The Chinese Otter (303)—The Badgers (303)—The American Badger (304)—The Teledu (305)—The Ratel (306)—The Skunks (307)—The Zorilla (307)—The Suriho (308)—The Common Skunk (308)—The Nyentek (310).

CHAPTER XV.

THE RACOONS AND PANDAS.

The Common Racoon (311)—The Crab-eating Racoon (313)—The California Coon (313)—The Coati (313)—The Red Coati (314)—The White Coati (314)—The Kinkajou (315)—The American Civet or Mountain Cat (316)—The Panda or Wah (316).

CHAPTER XVI.

THE BEARS.

The Bears (318)—The Polar Bear (318)—The Brown Bear (320)—The Syrian Bear (321)—The American Bears (322)—The Black Bear (322)—The Grizzly Bear (323)—The Bornean Sun Bear (325)—The Sloth or Lipped Bear (326)—The South American or Spectacled Bear (327).

CHAPTER XVII.

THE EARED SEALS AND WALRUSES.

The Eared-Seals (328)—The Fur Seals and Hair Seals (328)—The Sea-Lion (329)—The Sea-Bear (329)—Value of its Fur (330)—The Fur Seals (331)—The California Hair Seal (331)—The California or Northern Sea Lion (332)—Manner of Capturing it Alive (333)—The Walrus (334)

CHAPTER XVIII.

THE TRUE SEALS.

The Common Seals (337)—Their Wide Distribution (337)—Their Habits (338)—Their Love of Music (338)—Robbin's Reef (339)—The Caspian Seal (340)—The Hoe-Rat (340)—The Harp-Seal (340)—Richard's Seal (341)—The Bearded Seal (341)—The Gray Seal (342)—The White-bellied Seal (342)—The Sea Leopard (342)—The Crab-eating Seal (342)—The False Sea Leopard (343)—The Large-eyed Seal (343)—The Sea Elephant (344)—The Crested Seal (345)—The West Indian Seal (346). ˘

CETACEA.

CHAPTER I.

THE RIGHT WHALES.

The Cetacea (349)—The Family Balænidæ (350)—The Greenland Whale (350)—Its Mode of Respiration (351)—Its Blubber (351)—Whalebone (352)—The Young Whale (353)—Enemies of the Whale (354)—The Whale Fishery (355)—American Whalers (355)—Mode of Hunting the Whale (356)—The Harpoon and Bomb-lance (357)—Australian Right Whale (358)—Scrag Whale (358)—Biscay Whale (358)—Genus Eubalæna (358)—Genera Hunterius, Caperia, Macleayus (359).

CHAPTER II.

THE FINNER WHALES AND RORQUALS.

The Humpback or Bunched Whales (360)—The Rorquals or Big Finners (362)—Difficulty of Taking them (363)—The Northern Finner (364)—The Sulphur-bottom (364)—Adventure of the Ship "Plymouth" (364)—The Great Indian Rorqual (365)—Ancient Accounts of it (365)—The Pike Whale (366)—The Southern Rorqual (367)—The California Gray Whale (367).

CHAPTER III.

THE SPERM WHALES AND BLACK FISH.

The Family Catodontidæ (368)—The Sperm Whales (368)—The Spermaceti (369)—Their Speed (370)—Their Fury when Provoked (370)—The Story of the Ship "Essex (371)—Other Ships Destroyed by this Whale (371)—Ambergris (372)—Speculations as to its Origin (372)—Food of the Sperm Whale (372)—Black Fish (373)—The Genus Cogia (374).

CHAPTER IV.

THE BEAKED WHALES AND THE NARWHALS.

The Family Hyperoodontidæ (375)—The Beaked Whales (375)—The Bottle-nosed Whale (375)—The Xiphius (376)—The Family Monodontidæ (377)—The Narwhal (377)—The Extra-

ordinary Horn (378)—Conjectures as to its Use (378)—Fables Respecting it (379)—Medicinal Properties attributed to it (379)—Value of the Narwhal to the Greenlanders (380)—Ships Struck by it (380).

CHAPTER V.

THE DOLPHINS.

The Delphinidæ (381)—The Soosook or Dolphin of the Ganges (382)—The Inia (383)—The Lorelei of the Amazon River (383)—The Tucuxi (384)—The Dolphins Proper (385)—Legends—Symbols (385)—The Common Dolphin (386)—The White-beaked Dolphin (387)—The Bottle-nosed Dolphin (387).

CHAPTER VI.

THE PORPOISES AND WHITE WHALES.

The Common Porpoise (388)—The Grampus, or Gladiator Dolphin (390)—Its Destructiveness (391)—Its Name "The Thresher" (391)—The Pilot Whale, or Caaing Whale, or Grind (392)—Mode of Capturing (392)—The White Whale (393)—Specimens Exhibited in Shows (394).

LIST OF ILLUSTRATIONS.

VOLUME ONE.

PLATE	ORDER	
I.....	I.	QUADRUMANA..... <i>Frontispiece.</i>
II.....	I.	QUADRUMANA..... <i>To face page</i> 54
III.....	I.	QUADRUMANA..... 96
IV.....	II.	CHEIROPTERA..... 128
V.....	III.	INSECTIVORA..... 150
VI.....	IV.	CARNIVORA..... 182
VII.....	IV.	CARNIVORA..... 188
VIII.....	IV.	CARNIVORA..... 196
IX.....	IV.	CARNIVORA..... 206
X.....	IV.	CARNIVORA..... 218
XI.....	IV.	CARNIVORA..... 212
XII.....	IV.	CARNIVORA..... 228
XIII.....	IV.	CARNIVORA..... 242
XIV.....	IV.	CARNIVORA..... 266
XV.....	IV.	CARNIVORA..... 274
XVI.....	IV.	CARNIVORA..... 284
XVII.....	IV.	CARNIVORA..... 256
XVIII.....	IV.	CARNIVORA..... 262
XIX.....	IV.	CARNIVORA..... 294
XX.....	IV.	CARNIVORA..... 302
XXI.....	IV.	CARNIVORA..... 312
XXII.....	IV.	CARNIVORA..... 318
XXIII.....	IV.	CARNIVORA..... 322
XXIV.....	IV.	CARNIVORA..... 326
XXV.....	IV.	CARNIVORA..... 332
XXVI.....	IV.	CARNIVORA..... 344
XXVII.....	V.	CETACEA..... 354
XXVIII.....	V.	CETACEA..... 362
XXIX.....	V.	CETACEA..... 370

CONTENTS.

MAMMALIA.

CHAPTER I.

Inanimate and Animated Nature (1)—The Mineral (1), Vegetable (2), and Animal (3) Kingdoms—Classification of Animals (4)—The Vertebrates (4)—Classes of Vertebrates (5).

CHAPTER II.

The Class Mammalia (6)—General Characteristics (7)—The "Dental Formula" (8)—Division into Orders (13).

QUADRUMANA.

CHAPTER III.

GENERAL CHARACTERISTICS.

The General Characteristics of Quadrumana (17)—Their Habits in their Native Haunts (18)—Their Gregarious Disposition (20)—Division of the Quadrumana (22).

CHAPTER IV.

THE ANTHROPOID APES.

The African Division (23)—The Genus *Troglodytes* (23)—The Gorilla (23)—The Chimpanzee (27)—The Asiatic Division (32)—The Genus *Simia* (32)—Orang-Outan (32)—The Genus *Hylobates* or Gibbon (35).

CHAPTER V.

THE OLD WORLD MONKEYS.

The Long-tailed Monkeys (41)—The Genus *Semnopithecus* (41)—The Proboscis Monkey (44)—The Douc (45)—The Genus *Colobus* (45)—The Guereza (45).

CHAPTER VI.

BABOONS AND MACAQUES.

The Family *Cynopithecidae* (47)—The Genus *Myiopithecus* or Talapoin (47)—The Genus *Cercopithecus* (47)—The Guenons (51)—The Genus *Cercocercus* or Mangabeys (52)—The Genus *Theropithecus* or Gelada (53)—The Genus *Cynocephalus* or Baboon (54)—The Baboon Proper (56)—The Chacma (58)—Its Use in Finding Water (58)—The Sphinx (60)—The Hamadryad (61)—Its Pugnacious Disposition (61)—Disgusting Character of the Mandrill and Drill (62).

CHAPTER VII.

BABOONS AND MACAQUES.—*Continued.*

Genus *Macacus* (63)—The Common Macaque (65)—The Bonnet Ape (67)—The Rhesus or Bunder (68)—The Lapander (103)—The Wanderoo (71)—The Magots (72)—The Gibraltar Monkeys (72)—Genus *Cynopithecus* (74)—The Black Baboon-ape or Celebes (74).

CHAPTER VIII.

THE NEW WORLD MONKEYS.

The American Monkeys or Cebidæ (75)—The Genus *Cebus* or Sapajou (77)—The Genus *Lagothrix* (80)—The Spider Monkeys (81)—The Genera *Ateles* and *Eriodes* (87)—The Howling Monkeys (85)—The Sakis (89)—The Night Monkeys (92)—The Tec-tecs (94).

CHAPTER IX.

THE MARMOSETS.

The Marmosets or Ouistitis (95)—The Family Hapalidæ (97)—The Genus *Hapale* (97)—The Silky Marmoset (98)—The Pinche (98)—The Dwarf Marmoset (98)—The Genus *Midas* (99)—The Sagouins (99).

CHAPTER X.

THE LEMUROIDEA.

The Indris (102)—The Lemurs (104)—The Ruffed Lemur (105)—The Cat Lemur (106)—The Hapalemur (107)—The Cheirogaleus (108)—The Loris (110)—The Tarsier Spectre (114)—The Aye-aye (115).

CHEIROPTERA.

CHAPTER I.

GENERAL CHARACTERISTICS.

The Order Cheiroptera (121)—Superstitious Dread of Bats (122)—Their Usefulness (122)—Their Flying Apparatus (124)—Their General Characteristics and Habits (124)—The Genera of the Order (127).

CHAPTER II.

THE VAMPIRES.

The Fruit-eating Bats or Flying Foxes (129)—The Kalongs (129)—The Leaf-nosed Bats or Vampires (130)—The Horseshoe Bats (134)—The *Rhinopoma* (136).

CHAPTER III.

THE TRUE BATS.

The Common Bat (137)—The *Taphozous* (138)—The *Pipistrelle* (138)—The *Barbastelle* (139)—The California Bat (140)—The Great Bat of Britain (140)—The New York Bat (141)—The Carolina Bat (141)—The Hoary Bat (142)—The Long-eared Bat (142)—The Big-eared Bat (142)—The *Noctilionidæ* (143)—The Genus *Nycticeius* (143)—The Genus *Nyctinomus* (144)—The Genus *Noctilio* (144).

INSECTIVORA.

CHAPTER I.

THE FLYING LEMURS, ELEPHANT SHREWS AND PENTAIL.

Characteristics of the Order (147)—Its Division into Nine Families (148)—The Galeopithecidæ (149)—The Flying Lemurs (149)—The Macroscelididæ or Elephant Shrews (151)—The Genus Rhynchocyon (152)—The Genus Petrodromus (153)—The Tupaiadæ (153)—The Bangsring (154)—The Press (154)—The Genus Hylomys (155)—The Genus Ptilocercus (155)—The Pentail (155)

CHAPTER II.

THE HEDGEHOGS, MOLES, AND SHREWS.

The Erinaceidæ (157)—The Hedgehogs (158)—The Genus Gymnura (159)—The Centetidæ (159)—The Tenrec and Tendrac (161)—The Genus Solenodon (161)—The Agouti (161)—The Potamogalidæ (162)—The Chrysochloridæ or Golden Moles (163)—The Talpidæ (163)—The Moles (163)—The Genus Talpa (163)—Genus Condylura (164)—The Star-nosed Moles (165)—The Genus Scalops or American Mole (165)—The Genus Mygale (166)—The Desmans (166)—The Urotrichus (167)—The Soricidæ or Shrews (168).

CARNIVORA.

CHAPTER I.

CHARACTERISTICS OF THE ORDER.

The Carnivora or Flesh-eaters (173)—General Characteristics of the Order (173)—Its Function in the Economy of Nature (174)—Its Geographical Distribution (175)—Its Division into Families (175).

CHAPTER II.

THE LION.

The Lion (178)—Their Size and Strength (179)—Their Roar (180)—Their Habits (180)—Different Opinions of their Character (181)—Modes of Destroying (182)—The African Lion, the Cape Lion, the Gambia Lion, the Lion of North Africa (183)—The Asiatic Lion, the Maneless Lion (183)—Tame Lions (186)—Dangerous Pets (187).

CHAPTER III.

THE TIGER.

The Tiger (188)—Its Favorite Haunts (188)—Its Destructiveness (189)—Tiger Hunting (191)—Modes of Killing the Tiger (192)—Tame Tigers (194)—The Tiger in Ancient Times (195).

CHAPTER IV.

PANTHERS AND LEOPARDS.

The Cougar or American Panther (196)—The Jaguar (198)—Its Destructiveness (199)—A Tame Jaguar (200)—The African Leopard (201)—The Asiatic Leopard or Panther (202)—The Japanese Panther (202)—The Black Panther (203).

CHAPTER V.

THE OCELOTS AND THE CATS.

The Marbled Cat (205)—The Tiger Cats (205)—The Common Ocelot (205)—The Painted Ocelot (206)—The Syra (207)—The Chati (207)—The Long-tailed Cat (207)—The Pampas Cat (207)—The Clouded Tiger (208)—The Colocolo (208)—The European Wildcat (209)—The Manul (211)—The Malay Cat (211)—The Dwarf Cat (211)—The Egyptian Cat (212)—Letting the Cat out of the Bag (212)—The Common Cat (214)—The Marten Cat (215)—The Serval (215).

CHAPTER VI.

THE LYNXES AND CHEETAHS.

The Genus Lynx (217)—The Persian Lynx (217)—The Caracal (218)—The European Lynx (219)—The Booted Lynx (220)—The Canadian Lynx (220)—The American Wild-Cats (222)—The Genus Cynælurus (223)—The Cheetah or Hunting Leopard (224).

CHAPTER VII.

THE CIVET CATS.

The Cryptoproctidæ (226)—The Galet (226)—The Viverridæ (227)—The Civet (228)—The Zibeth (228)—The Genets (230)—The Pale Genet (231)—The Linsang (230)—The Hemigale (230)—The Binturong (231)—The Nandinia (231)—The Pougoune (231)—The Musang (231)—The Masked Paguma (232)—The Mampalon (233)—The Ichneumons (233)—The Mungos or Mangouste (234)—The Egyptian Ichneumon (235)—The Crab-eating Mangouste (237)—The Zebra Mangouste (237)—The Meerkat (238)—The Zenick (238)—The Mangué (239)—The Banded Mungos (239).

CHAPTER VIII.

THE AARD-WOLF AND THE HYÆNAS.

The Family Protelidæ (240)—The Aard-wolf (240)—The Family Hyænidæ (241)—Fables and Superstitions about the Hyæna (241)—The Striped Hyæna (242)—Two Tame Ones (243)—The Brown Hyæna (243)—The Spotted Hyæna or Tiger-Wolf (244)—Rapacity of this Species (244)—Its Horrid Laughter (245).

CHAPTER IX.

THE WOLVES.

General Description of the Genus Canis (246)—The Common European Wolf (247)—The Jackal Wolf (250)—The Kaberoo (250)—The Striped Wolf (250)—The American Wolves (251)—The Gray Wolf (251)—The Red Wolf (252)—The Coyote (253)—The South American Wolves (253)—The Crab-eating Wolf (254)—The Aguarachay (253).

CHAPTER X.

THE JACKALS AND FOXES.

The Jackal (255)—The Landjak (256)—The Common Fox (256)—The Raccoon Dog (259)—The Corsac (260)—The Caama (260)—The Fennek (260)—The American Foxes (261)—The Red Fox (261)—The Silver or Black Fox (261)—The Cross Fox (261)—The Kid Fox (262)—The Gray Fox (262)—The Arctic Fox (262)—The Blue Fox (263)—The Large-eared Fox (264)—The Hunting Dog (264).

CHAPTER XI.

THE DOG.

The Wild Dogs (265)—The Dhole (265)—The Alpine Wolf (266)—The Domesticated Dog (266)—Regard in which the Dog is Held (267)—Abhorrence of the Dog by the Orientals (267)—The Dogs of the East (267)—The Dog in Antiquity (268)—The Mental Qualities of the Dog (268)—Its Moral Sense (269)—Its Affection for its Master (270)—Rabies or Hydrophobia (270).

CHAPTER XII.

THE SPORTING DOGS.

Modes of Classification (273)—Sporting Dogs (273)—The Scotch Greyhound (273)—The Irish Greyhound (274)—The African Greyhound (274)—The Common Greyhound (275)—The Hare Indian Dog (276)—The Italian Greyhound (276)—The Stag Hound (277)—Fox Hound (277)—Harrier (277)—Beagle (277)—The Otter Hound (277)—The Dachs Hund and Turnspit (278)—The Bloodhound (278)—The Pointers and Setters (279)—The Spaniels (280)—Springers (280)—Cockers (280)—Water Spaniel (280)—Chesapeake Bay Dog (281)—Retriever (281).

CHAPTER XIII.

SHEPHERD'S DOGS AND HOUSE DOGS.

The Shepherd's Dog (282)—The Colley (282)—The Spitz (283)—The Esquimaux Dog (283)—The St. Bernard (284)—The Mastiff (284)—The Thibet Dog (285)—The Bulldog (285)—The Newfoundland Dog (285)—The Black and Tan Terrier (288)—The Scotch Terrier (288)—The Skye Terrier (288)—The Yorkshire Terrier (288)—The Bull-Terrier (288)—The Fox Terrier (289)—The Coach-Dogs (289)—The Pug (289)—The Poodle (289)—King Charles (290)—Blenheim (290)—The Mexican Mopsey (291)—The Dingo, or the Dog Relapsed into Barbarism (291).

CHAPTER XIV.

THE WEASELS, OTTERS AND SKUNKS.

The Martens (293)—The Sable (294)—The American Sable (295)—The Black Cat (295)—The Polecat (295)—The Ermine (296)—The Ferrets (296)—The New York Ermine (297)—The Mink (297)—The Weasels (298)—The Wolverine (299)—The Otters (300)—The Canada Otter (301)—The California Otter (302)—The Sea Otter (302)—The Brazilian Otter (303)—The Chinese Otter (303)—The Badgers (303)—The American Badger (304)—The Teledu (305)—The Ratel (306)—The Skunks (307)—The Zorilla (307)—The Suriho (308)—The Common Skunk (308)—The Nyentek (310).

CHAPTER XV.

THE RACOONS AND PANDAS.

The Common Raccoon (311)—The Crab-eating Raccoon (313)—The California Coon (313)—The Coati (313)—The Red Coati (314)—The White Coati (314)—The Kinkajou (315)—The American Civet or Mountain Cat (316)—The Panda or Wah (316).

CHAPTER XVI.

THE BEARS.

The Bears (318)—The Polar Bear (318)—The Brown Bear (320)—The Syrian Bear (321)—The American Bears (322)—The Black Bear (322)—The Grizzly Bear (323)—The Bornean Sun Bear (325)—The Sloth or Lipped Bear (326)—The South American or Spectacled Bear (327).

CHAPTER XVII.

THE EARED SEALS AND WALRUSES.

The Eared-Seals (328)—The Fur Seals and Hair Seals (328)—The Sea-Lion (329)—The Sea-Bear (329)—Value of its Fur (330)—The Fur Seals (331)—The California Hair Seal (331)—The California or Northern Sea Lion (332)—Manner of Capturing it Alive (333)—The Walrus (334).

CHAPTER XVIII.

THE TRUE SEALS.

The Common Seals (337)—Their Wide Distribution (337)—Their Habits (338)—Their Love of Music (338)—Robbin's Reef (339)—The Caspian Seal (340)—The Hoe-Rat (340)—The Harp-Seal (340)—Richard's Seal (341)—The Bearded Seal (341)—The Gray Seal (342)—The White-bellied Seal (342)—The Sea Leopard (342)—The Crab-eating Seal (342)—The False Sea Leopard (343)—The Large-eyed Seal (343)—The Sea Elephant (344)—The Crested Seal (345)—The West Indian Seal (346).

CETACEA.

CHAPTER I.

THE RIGHT WHALES.

The Cetacea (349)—The Family Balænidæ (350)—The Greenland Whale (350)—Its Mode of Respiration (351)—Its Blubber (351)—Whalebone (352)—The Young Whale (353)—Enemies of the Whale (354)—The Whale Fishery (355)—American Whalers (355)—Mode of Hunting the Whale (356)—The Harpoon and Bomb-lance (357)—Australian Right Whale (358)—Scrag Whale (358)—Biscay Whale (358)—Genus Eubalæna (358)—Genera Hunterius, Caperia, Macleayus (359).

CHAPTER II.

THE FINNER WHALES AND RORQUALS.

The Humpback or Bunched Whales (360)—The Rorquals or Big Finners (362)—Difficulty of Taking them (363)—The Northern Finner (364)—The Sulphur-bottom (364)—Adventure of the Ship "Plymouth" (364)—The Great Indian Rorqual (365)—Ancient Accounts of it (365)—The Pike Whale (366)—The Southern Rorqual (367)—The California Gray Whale (367).

CHAPTER III.

THE SPERM WHALES AND BLACK FISH.

The Family Catodontidæ (368)—The Sperm Whales (368)—The Spermaceti (369)—Their Speed (370)—Their Fury when Provoked (370)—The Story of the Ship "Essex" (371)—Other Ships Destroyed by this Whale (371)—Ambergris (372)—Speculations as to its Origin (372)—Food of the Sperm Whale (372)—Black Fish (373)—The Genus Cogia (374).

CHAPTER IV.

THE BEAKED WHALES AND THE NARWHALS.

The Family Hyperoodontidæ (375)—The Beaked Whales (375)—The Bottle-nosed Whale (375)—The Xiphius (376)—The Family Monodontidæ (377)—The Narwhal (377)—The Extra-

ordinary Horn (378)—Conjectures as to its Use (378)—Fables Respecting it (379)—Medicinal Properties attributed to it (379)—Value of the Narwhal to the Greenlanders (380)—Ships Struck by it (380).

CHAPTER V.

THE DOLPHINS.

The Delphinidæ (381)—The Soosook or Dolphin of the Ganges (382)—The Inia (383)—The Lorelei of the Amazon River (383)—The Tucuxi (384)—The Dolphins Proper (385)—Legends—Symbols (385)—The Common Dolphin (386)—The White-beaked Dolphin (387)—The Bottlenosed Dolphin (387).

CHAPTER VI.

THE PORPOISES AND WHITE WHALES.

The Common Porpoise (388)—The Grampus, or Gladiator Dolphin (390)—Its Destructiveness (391)—Its Name "The Thresher" (391)—The Pilot Whale, or Caaing Whale, or Grind (392)—Mode of Capturing (392)—The White Whale (393)—Specimens Exhibited in Shows (394).

SIRENIA.

THE SEA COWS.

The Order Sirenia (397)—Mermaids (397)—The Family Manatidæ (398)—The Manatees of America (399)—Their Voracity and Laziness (399)—Modes of Capture (399)—Tame Specimens (399)—The Florida Manatee (400)—The African Lamantin (400)—The Eastern Dugong (400)—The Australian Dugong (401)—The Northern Sea Cows (401)—Steller's Description (401)—Extinct since 1768 (403).

UNGULATA.

CHAPTER I.

HOOFED ANIMALS.

The Order Ungulata (407)—The Numerous Families (407)—The Ruminants (407)—Their Peculiar Stomach (408)—Horns (408)—Antlers (408)—Extinct Species (408)—The Original Horse Protohippus (409)—Gradual Development (409)—The Family Equidæ (409)—The Genus Equus (409)—The Horse (410)—The Tarpan or Wild Horse of Tartary (410)—The Mustang or Wild Horse of America (411).

CHAPTER II.

THE ARAB AND THE BARB.

Early Domestication of the Horse (416)—The Horse in Egypt (416)—Assyria—Judæa (416)—Greece—Persia (417)—Bits and Stirrups (417)—Chariot Races (417)—The Arab Horse (418)—Exaggerated Pedigrees (419)—The Best Arabs (419)—Their Training (419)—Attachment of the Arab for his Mare (420)—Speed and Endurance (421)—The Barb (422)—The Same Horse as the Arab (422)—Abd-el-Kader on the Horse (422).

CHAPTER III.

THE RACE-HORSE AND TROTTING HORSE.

The Race-Horse (425)—The English Turf (426)—The American Turf (427)—Imported Horses (427)—The Trotting-Horse (428)—Flora Temple (431)—Steve Maxwell (432)—St. Julien and Maud S (432)—The Narragansett Pacers (432)—Pocahontas (432).

CHAPTER IV.

EUROPEAN HORSES.

The Hunter (434)—The Hackney (434)—The Russian Horse (436)—The Austrian Horse (437)—The Holstein Horse (438)—The French Horse (438)—The Italian Horse (440)—The Races at Rome (440)—The Spanish Horse (440)—The Shetland Pony (441)—The Carriage Horse (443)—The Cart Horse (443)—The Percheron Horse (443).

CHAPTER V.

THE WILD AND THE COMMON ASS.

The Wild Asses (445)—The Kulan or Dziggetai (445)—Their Speed (446)—Domestication (446)—The Wild Ass of the Bible (447)—The African Wild Ass (448)—The Common Ass (448)—Its Patience—Its Intelligence (449)—The Egyptian Ass (450).

CHAPTER VI.

THE ZEBRAS.

The Zebras or Tiger-Horses (452)—The Quagga (452)—The Dauw, or Burchell's Zebra (453)—Harris's Description of it (454)—The Zebra Proper (454)—Hunting the Zebra (455)—Cross-Breeds (456)—The Mule (456)—The Hinny (456)—Instances of their Fertility (457)—Darwinism (457).

CHAPTER VII.

THE TAPIRS.

The Family Tapiridæ (458)—The American Tapir (458)—Its Trunk (459)—Its Habits (459)—The Tapir as a Domestic Animal (460)—A Tapir Hunt (461)—Peculiar Marks of the Young Tapir (461)—The Malay Tapir (462)—Its Trunk (462)—Its Color (462)—Discovery of the Animal (462)—Chinese Account (463)—The Pinchaque (463)—Baird's Tapir (463).

CHAPTER VIII.

THE RHINOCEROS.

The Family Rhinocerotidæ (464)—General Description (464)—The Horn—Peculiar Structure of the Horn (465)—Known to the Ancients (466)—Wood-cut by Albert Durer (466)—Arab Superstitions (466)—Haunts of the Rhinoceros (466)—A Nocturnal Animal (467)—Its Food—Its Habits (467)—Its Senses (468)—Its Fits of Rage (468)—Maternal Affection (469)—Its Friends the Small Birds (469)—Captive Rhinoceroses (470)—Uses of its Hide (470).

CHAPTER IX.

THE ASIATIC RHINOCEROSES.

The One-horned Rhinoceroses (470)—The Indian Rhinoceros (470)—Its Thick Hide (470)—Mode of Hunting (473)—The Wara or Javanese Rhinoceros (473)—The Emperor Baber (474)—

The Two-horned Rhinoceros or Badak of Sumatra (474)—The Fire-eating Rhinoceros (476)—The Rough-eared Rhinoceros (476).

CHAPTER X.

THE AFRICAN RHINOCEROS.

The Borele or Little Black Rhinoceros (477)—The Sword-Hunters of Abyssinia (479)—The Keitloa (479)—Their Fierceness (480)—The Mohogoo or White Rhinoceros (481)—Hunting Adventure of Mr. Oswald (482)—The Kobaoba (484)—Probability of its Extinction (484).

CHAPTER XI.

THE HIPPOPOTAMUS.

The Hippopotamus or River Horse (485)—Description (486)—Habits (486)—Favorite Haunts (487)—Food (487)—Violence when Provoked (488)—Maternal Affection (488)—Modes of Hunting (489)—Pitfalls and Downfalls (489)—Harpooning (489)—The Hippopotamus in Captivity (491)—The Small or Liberian Hippopotamus (492).

CHAPTER XII.

THE PECCARIES.

The Swine Family (493)—General Characteristics (493)—The Peccaries (494)—The Collared Peccary (494)—Its Courage and Fierceness (495)—The White-lipped Peccary (495)—Its Habits (495)—Methods of Hunting the Peccary (496)—Flesh of the Peccary (497).

CHAPTER XIII.

THE TRUE SWINE.

The Genus *Sus* (498)—Religious Prohibitions (498)—The Boar of Valhalla (499)—The Boar's Head (499)—The Wild Boar of Europe (499)—Hunting the Wild Boar (500)—The Wild Hog of India (501)—The Domestic Hog (502)—Anecdotes of the Hog (502)—Breeds of Hogs (504)—The Berkshire (504)—Trichiniasis (504).

CHAPTER XIV.

THE RIVER-HOGS, BABYROUSSA, AND WART-HOGS.

The River Hogs (506)—The Pencilled Hog (506)—The Bush Hog, or Bosch Vark (507)—Edwards' River-Hog (508)—The Babyroussa (508)—Its Peculiar Tusks (508)—The Wart-Hogs (509)—Hideous Appearance (510)—The African Wart-Hog, or Vlacke Vark (510)—The Wart-Hog of Ælian or Engallo (511).

CHAPTER XV.

THE CAMEL.

The Ruminants (512)—The Camelidæ (512)—The Camels of the Old World (513)—The Arabian Camel, or Dromedary (514)—The Camel in the Bible (515)—The Camel in Europe (515)—The Camel in Africa (515)—Its Food (516)—Its Powers of Resisting Thirst (516)—Its speed (517)—Mode of Riding (517)—Its Behavior when Loading (518)—Its Vices (519)—Anecdote of Latif Pacha (520)—Its Value (521)—The Two-humped Camel of Bactria (522).

CHAPTER XVI.

THE LLAMAS.

The American Camelidæ (524)—The Genus *Auchenia* (524)—The Guanaco (525)—Its Habits (526)—The Llama (527)—Its Use as a Beast of Burden (527)—The Alpaca or Paco (528)—Its Wool (528)—The Vicuna (529)—Indian Hunts (530).

CHAPTER XVII.

THE MOUSE DEER.

The Tragulidæ or Hornless deer (532)—Disputes of Naturalists (532)—The Kanchil (532)—Its Appearance and Habits (533)—Attempts to introduce it to Europe (534).

CHAPTER XVIII.

THE DEER.

The Cervidæ (535)—Their Antlers (535)—The Process of Growth of the Antler (536)—The Shedding of the Velvet (536)—Habits of the Cervidæ (538)—The Various Genera (538)—The Elk of the Old World or the Moose of the New World (539)—The Elk of Sweden (539)—The Moose of Canada (541)—Habits—Modes of Hunting (541).

CHAPTER XIX.

THE REINDEER AND THE CARIBOU.

The Reindeer (544)—Its Life in Northern Europe (545)—Its Life in Siberia (546)—Its Life when Domesticated (547)—Its Value (547)—The Caribou (548)—Modes of Hunting it (548).

CHAPTER XX.

THE TRUE DEER.

The True Deer (550)—The Wapiti (550)—The Red Deer of Europe (552)—The Virginian Deer or Carcajou (554)—The Persian Deer (556)—The Indian Species (556)—The Barasinga (556)—The Axis Deer (557)—The Sambur (557)—The Maned Stag (557)—The Hog Deer (558)—The South American Species (558)—The Pampas Deer (558)—The Red Deer or Guasupita (559).

CHAPTER XXI.

THE FALLOW DEER, ROE DEER, AND MUSK DEER.

The Genus *Dama* (560)—Fallow Deer (560)—Genus *Capreolus* (562)—Roe Deer (562)—Genus *Cervulus* (564)—Muntjak or Kidang (564)—Genus *Moschus* (565)—Musk Deer (565)—Its Abode—Habits—The Musk (566).

CHAPTER XXII.

THE GIRAFFE.

The Camelopardalidæ or Giraffes (568)—Its Size and Appearance (569)—Its Habitat (570)—Its adaptation to its Location (570)—Its Movements (570)—Its Food (571)—Its Senses (572)—Giraffes in London and Paris (572)—Modes of Hunting (572)—Meaning of the Word "Giraffe" (573).

CHAPTER XXIII.

THE HOLLOW-HORNED RUMINANTS.

The Bovidæ (574)—The Thirteen Sub-families (574)—The Bovinæ (575)—The Genus Bos (575)—The Domestic Ox (575)—The Wild Cattle (576)—The Cattle of the Pampas (577)—Cattle of Africa (578)—Domestic Cattle (579)—The Highland Cattle (582)—The Durham (582)—The Alderney (582).

CHAPTER XXIV.

THE BISONS.

The Bonassus or European Bison (584)—Called also the Aurochs (584)—The Real Aurochs Extinct (584)—The Forest or Bialowicz (584)—Description of the Bonassus (585)—The Bison of the Caucasus (586)—The American Bison or Buffalo (586)—Enormous Numbers (586)—Terrible Destruction (587)—Estimate of Numbers Killed (588)—The Mountain Buffalo (589)—Death of a Bull (590).

CHAPTER XXV.

EASTERN CATTLE.

The Domestic Cattle of India (591)—The Zebu (591)—The Wild Cattle of India (592)—Genus Bibos (593)—The Gayal (593)—The Gaur (594)—The Banteng (595)—Genus Poephagos (595)—The Yak (595)—The Plough Yak (596)—Hunting the Yak (597)—Genus Anoa (597)—The Chamois Buffalo or Celebes (597)—Its Fierceness (598).

CHAPTER XXVI.

THE BUFFALOES.

The Genus Bubalus (599)—The Cape Buffalo (599)—Drayson's Account (600)—Buffalo Shooting (602)—The Indian Buffalo (602)—Buffalo and Tiger Fights (603)—Williamson's Account (604)—The Kerabau (605)—The Domesticated Buffalo (605)—Its Habits—Its Uses (606).

CHAPTER XXVII.

THE ANTELOPES.

The Antelopes (607)—The Eland (607)—The Koodoo (609)—The Bosch-bok (610)—The Nyghau (611)—The Passan (613)—The Beisa (614)—The Sabre Antelope (614)—The Addax (614)—The Sable Antelope (615)—The Blau Bok (616).

CHAPTER XXVIII.

THE GAZELLES.

The Gazelle (617)—Its Beauty and Grace (617)—The Ariel Gazelle (618)—The Jairou (619)—The Spring-Bok (620)—Its Immense Numbers (620)—The Dseren (622)—The Sasin (623)—The Pallah (624)—The Saiga (624)—The Sub-family Antilocaprinæ (625)—The Prong Horn (625).

CHAPTER XXIX.

THE LESSER ANTELOPES.

The Ourebi (627)—The Klippspringer (628)—The Water Buck (628)—The Blue Buck (630)—The Musk Antelope (629)—The Duyker Bok (630)—The Rhoode Bok (631)—The Chickara

(631)—The Hartebeest (632)—The Sassyb (632)—The Gnu (633)—The Chamois (633)—The Goral (635)—The Mountain Goat of the Rocky Mountains (638).

CHAPTER XXX.

GOATS AND IBEXES.

The Genus *Capra* (637)—The Goats (637)—The Bezoar Goat or Paseng (639)—The Cashmere Goat (639)—The Angora Goat (640)—The Mamber Goat (641)—The Markhor and Tahir (641)—The Egyptian Goat (641)—The Ibexes (642)—The Alpine Ibex (642)—The Pyrenean Ibex (643)—The Arabian Ibex (644).

CHAPTER XXXI.

THE SHEEP AND THE MUSK-OX.

The Aoudad (646)—The Moufflon (647)—The Argali (647)—The Katshkar (648)—The Big Horn (648)—Its Habits (649)—Fat-tailed Sheep (649)—The Cretan Sheep (650)—The Southdown (651)—The Leicester (651)—The Merino (652)—The Highland Sheep (653)—The Genus *Ovibos* (653)—The Musk-ox of North America (654).

PROBOSCIDEA.

CHAPTER I.

ELEPHANTS IN GENERAL.

The Order Proboscidea—Derivation of Name (657)—The Family Elephantidæ (657)—Fossil Elephants—The Mammoth (657)—The Mastodon (658)—The Elephant (659)—Its Trunk—Its Tusks (660)—The Elephant in History (661)—In the East—In Rome—In Modern Times (663).

CHAPTER II.

THE ASIATIC ELEPHANT.

The Asiatic Elephant (665)—Its Use (666)—Mode of Capture in Ceylon (666)—Points of a Good Elephant (669)—White Elephants (670)—Funeral of a White Elephant (670)—The Dwarf Elephant (671).

CHAPTER III.

THE ELEPHANT.

The African Elephant—Difference from the Indian Elephant (672)—Hunting the Elephant (672)—Delegorgue (672)—Gordon Cumming (673)—The Abyssinian "Hock-cutters" (674)—Captive Elephants (676)—Baby Elephants (676)—Anecdotes of Elephants (677).

HYRACOIDEA.

THE ROCK RABBITS.

The Order Hyracoidea (681)—The Genus *Hyrax* (681)—Its Characteristics (682).

RODENTIA.

CHAPTER I.

RATS AND MICE.

The Order Rodentia (687)—The Family Muridæ (688)—Rats and Mice (688)—The Black Rat (688)—The Brown Rat (688)—The Mouse (689)—The Harvest Mouse (689)—The Barbary Mouse (690)—The Hamster (690)—The Musk Rat (692)—The Water Rat (693)—The Field Mouse (693)—Wilson's Meadow Mouse (694)—Le Conte's Mouse (691)—The Cotton Rat (692)—The Lemming (695).

CHAPTER II.

MOLE RATS, POUCH RATS, AND BEAVERS.

The Mole Rat (696)—The Jerboa (697)—The Alactaga (697)—The Cape Leaping Hare (697)—The Hudson Bay Jumping Mouse (698)—The Fat Dormouse (698)—The Common Dormouse (699)—The Pouched Rats (699)—The Beavers (701)—The American Beaver (702)—The European Beaver (704).

CHAPTER III.

THE SQUIRRELS AND MARMOTS.

The Family Sciuridæ (707)—The European Squirrel (707)—The Javanese Squirrel (708)—The Hare Squirrel (708)—The Black Squirrel (708)—The Gray Squirrel (708)—The Northern Gray Squirrel (709)—The Red Squirrel (709)—The Long-haired Squirrel (710)—The Flying Squirrel (710)—The American Flying Squirrel (711)—The Taguan (711)—The Chipmuck (712)—The Leopard Marmot (713)—The Marmot (714)—The Babac (715)—The Woodchuck (715)—The Prairie Dog (716).

CHAPTER IV.

THE SEWELLELS, PORCUPINES, AND CAVIES.

The Family Haplodontidæ (718)—The Family Chinchillidæ (718)—The Chinchillas and Visachas (719)—The Octodontidæ (720)—The Hutia Conga (720)—The Degu (721)—The Tukotugo (722)—The Gundy (722)—The Coypu (723)—The Ground Pig (723)—The Canadian Porcupine (724)—The Tufted-tailed Porcupines (726)—The Agouti (726)—The Sooty Paca (727)—The Capybara (727)—The Guinea Pig (728)—The Mara (728)—The Pikas (729).

CHAPTER V.

HARES AND RABBITS.

The Family Leporidæ (730)—The American Hares (730)—The Polar Hare (730)—The Northern Hare (731)—The Wood Hare (731)—The Jackass Rabbit (731)—The African Hares (731)—The Sand Hare (732)—The Common Hare (732)—The Alpine Hare (733)—The Rabbit (733)—The Wild Rabbit (734)—The Domestic Rabbit (734).

EDENTATA.

CHAPTER I.

THE SLOTHS AND ARMADILLOS.

The Edentata (737)—The Sloths (737)—The Two-toed Sloth (738)—The Ai or Three-toed Sloth (738)—The Spotted Sloth (739)—The Scaly Ant-eaters (739)—The Phatagin (739)—The

Pangolin (740)—The Tatouhon (740)—The Giant Armadillo (740)—The Tatouay (741)—The Armadillo (741)—The Apar (741)—The Picheogo (742).

CHAPTER II.

THE AARD VARK AND ANT-EATERS.

The Aard Vark of the Cape (743)—The Great Ant-eater or Tamanoir (744)—The Tamandua (745)—The Little Ant-eater (746).

MARSUPIALIA.

CHAPTER I.

THE OPOSSUMS AND BANDICOOTS.

The Marsupials (749)—The True Opossum (749)—The Virginia Opossum (750)—Merrian's Opossum (750)—The Crab-eating Opossum (750)—The Yapock (750)—The Pouched Mouse (751)—The Tasmanian Devil (751)—The Native Cat (751)—The Zebra Wolf (752)—The Native Ant-eater (752)—The Striped Bandicoot (752)—The *Chæropus* (753).

CHAPTER II.

THE KANGAROOS, PHALANGERS, AND WOMBATS.

The Kangaroo (754)—The Woolly Kangaroo (755)—The Wallabee (755)—The Rock Kangaroo (755)—The Tree Kangaroo (756)—The Kangaroo Hare (756)—The Jerboa Kangaroo (756)—The Potoroo (757)—The Koala (757)—The Sooty Phalangist (757)—The Valpine Phalangist (758)—The Cuscus (758)—The Taguan (758)—The Great Flying Phalanger (759)—The Sugar Squirrel (759)—Opossum Mouse (759)—The Wombat (760).

MONOTREMATA.

THE DUCK MOLE AND AUSTRALIAN HEDGEHOG.

The Monotremata (763)—The Family Ornithorhynchidæ (763)—The Duck Mole (763)—The Family Echidnidæ (765)—The Native Hedgehog (766)—The Tasmanian Species (766)—Conclusion.

LIST OF ILLUSTRATIONS.

PLATE	ORDER	
I.....	I. QUADRUMANA.....	<i>Frontispiece.</i>
II.....	I. QUADRUMANA.....	<i>To face page 54</i>
III.....	I. QUADRUMANA.....	96
IV.....	II. CHEIROPTERA.....	128
V.....	III. INSECTIVORA.....	150
VI.....	IV. CARNIVORA.....	182
VII.....	IV. CARNIVORA.....	188
VIII.....	IV. CARNIVORA.....	196
IX.....	IV. CARNIVORA.....	206
X.....	IV. CARNIVORA.....	218
XI.....	IV. CARNIVORA.....	212
XII.....	IV. CARNIVORA.....	228
XIII.....	IV. CARNIVORA.....	242
XIV.....	IV. CARNIVORA.....	266
XV.....	IV. CARNIVORA.....	274
XVI.....	IV. CARNIVORA.....	284
XVII.....	IV. CARNIVORA.....	256
XVIII.....	IV. CARNIVORA.....	262
XIX.....	IV. CARNIVORA.....	294
XX.....	IV. CARNIVORA.....	302
XXI.....	IV. CARNIVORA.....	312
XXII.....	IV. CARNIVORA.....	318
XXIII.....	IV. CARNIVORA.....	322
XXIV.....	IV. CARNIVORA.....	326
XXV.....	IV. CARNIVORA.....	332
XXVI.....	IV. CARNIVORA.....	344
XXVII.....	V. CETACEA.....	354
XXVIII.....	V. CETACEA.....	362
XXIX.....	V. CETACEA.....	370
XXX.....	VI. SIRENIA.....	398
XXXI.....	VII. UNGULATA.....	416
XXXII.....	VII. UNGULATA.....	428
XXXIII.....	VII. UNGULATA.....	448

PLATE	ORDER	PAGE
XXXIV.....	VII. UNGULATA.....	458
XXXV.....	VII. UNGULATA.....	472
XXXVI.....	VII. UNGULATA.....	486
XXXVII.....	VII. UNGULATA.....	504
XXXVIII.....	VII. UNGULATA.....	512
XXXIX.....	VII. UNGULATA.....	526
XL.....	VII. UNGULATA.....	544
XLI.....	VII. UNGULATA.....	538
XLII.....	VII. UNGULATA.....	560
XLIII.....	VII. UNGULATA.....	570
XLIV.....	VII. UNGULATA.....	582
XLV.....	VII. UNGULATA.....	588
XLVI.....	VII. UNGULATA.....	598
XLVII.....	VII. UNGULATA.....	608
XLVIII.....	VII. UNGULATA.....	618
XLIX.....	VII. UNGULATA.....	638
L.....	VII. UNGULATA.....	648
LI.....	VIII. PROBOSCIDEA.....	666
LII.....	VIII AND IX. PROBOSCIDEA AND HYRACOIDEA.....	672
LIII.....	X. RODENTIA.....	688
LIV.....	X. RODENTIA.....	696
LV.....	X. RODENTIA.....	704
LVI.....	X. RODENTIA.....	710
LVII.....	X. RODENTIA.....	710
LVIII.....	X. RODENTIA.....	722
LIX.....	X. RODENTIA.....	728
LX.....	X. RODENTIA.....	734
LXI.....	XI. EDENTATA.....	744
LXII.....	XII. MARSUPIALIA.....	750
LXIII.....	XII. MARSUPIALIA.....	756
LXIV.....	XIII. MONOTREMATA.....	764

ZOOLOGIA

CHAPTER I.

INANIMATE AND ANIMATED NATURE—THE MINERAL, VEGETABLE AND ANIMAL KINGDOMS—
CLASSIFICATION OF ANIMALS—THE VERTEBRATES—CLASSES OF VERTEBRATES.

THE first and simplest division which an observer must make in the infinite variety of natural objects by which he is surrounded is a division between things living or **ANIMATED** and things lifeless or **INANIMATE**. He sees the corn springing up from the seed, increasing to maturity, then withering; he sees the tree shooting heavenward, towering higher and spreading wider year after year till a pause comes to its development, and then he sees its branches decay and its trunk moulder, and knows that the giant of the forest, like the grass of the field, will fade and die. He knows, too, that the beasts of the earth, the birds of the air, the fishes of the sea, all the thousand tribes of creatures which people the globe, will pass, like the tree or plant, from the seed to maturity, from maturity to death. He knows that man himself is no exception to this law of change; that he grows to manhood and declines into old age; that from the cradle to the grave he changes surely and uninterruptedly day by day, and year by year. But the cliffs which lift their heads to the clouds, the rocks which crop out from the hillside, the stones he treads on, present no such phenomena of growth or decay. Man may shatter them, earthquakes may rend them, frost may disintegrate them, rain may wash them, but the alterations thus effected are merely physical results of physical causes acting from without, not the results of an indwelling force in rock or stone: even when, as in the case of crystals, an increase of size takes place, this increase is not a growth from within but an augmentation by the addition of particles from the outside. The **MINERAL KINGDOM** is a kingdom of the dead.

If we examine the bodies comprehended in the **MINERAL KINGDOM** more closely, we find that, in addition to the entire absence of any tendency to periodic change, they are characterized by possessing a very simple chemical composition; they often consist of only one ele-

ment, or if they are composite, they are simple compounds of two or three elements. We find, too, that mineral bodies are either of indefinite shape or crystalline, and that they are composed of similar particles which do not stand in any definite relation to each other. In technical language they are *amorphous* and *homogeneous* bodies.

Every substance which has yet been examined is found to consist of one or more elements. These elements, sixty-three in number, are divided into forty-nine metals and fourteen non-metals; in the latter class are placed those substances which at ordinary temperatures are gaseous in form, such as oxygen, hydrogen and the like, as well as some solid bodies, such as sulphur, phosphorus and carbon. All the known elements occur variously dispersed in the solid mass of the earth, only four in the air, but thirty in the sea. Among the compounds of these elements there is a very peculiar class which form a characteristic and essential portion of the bodies of animals. These compounds are of very complicated constitution; they do not crystallize, but exist in a jelly-like form. They all contain sulphur, and most of them phosphorus, in addition to carbon, hydrogen, oxygen and nitrogen. To a substance closely allied to these *albuminous* compounds, the name of "protoplasm" has been given, and apparently no other form of matter can manifest what we call vital phenomena.

Leaving INANIMATE NATURE to be discussed and described in treatises of Geology, Mineralogy, Chemistry or Physics, let us cast a further look on the division to which we have attributed LIFE.

We observe that these bodies pass through sundry periodic changes, that they grow and decay, and that although subject to the universal physical and chemical laws, they possess a something which enables them to resist or check these laws. We see they increase, not by the mere external addition of particles from outside, but by the assimilation of foreign substances which they take into their interior; and if we continue our observation of them for a sufficient length of time, we discover that they can produce germs which, circumstances favoring, will develop into the likeness of their parent. In other words, we see that they possess organs of nutrition and reproduction. If we examine further these bodies which possess life, we find that the chemical elements of which they are composed form complex organic compounds which differ fundamentally from any inorganic compound by exhibiting an *organized structure*. Such an organized structure is seen in the simple cell, the

germ of living organisms; it cannot be prepared artificially from its elementary constituents, but is the sole and direct product of life. All bodies possessing life consist essentially of cells, minute solid particles and fibres.

Again, in these living bodies the ordinary spectator perceives at once a great and striking difference. The grass indeed waves in the wind, the trees bow to the tempest, the flower turns to the light, the sensitive plant shrinks from the touch. But the snake creeps through the grass, the birds fly from tree to tree, the bee or the butterfly hovers over the flower, the seas and rivers are filled with creatures that swim through the waters. Such bodies not merely live, but live and move. The tree seems not to feel a pang when the woodman's axe cuts into its tissues, the grass does not apparently feel the scythe, but the moving creatures are susceptible of pain and pleasure. They not merely live, but live and move and feel.

Linnæus, the father of Natural History, said that "Plants grow, animals grow and move," and his definition will suffice for the higher classes of animals and plants; but modern microscopic investigations show that it will not do for the lower classes. Many of the plants possess powers of locomotion, many of the animals are rooted to solid objects and destitute of any nervous organization. Perhaps the most reliable test which enables us to distinguish between the animal and the plant is the nature of their food, although even this test is not of universal application.

We may distinguish, then, between the VEGETABLE and ANIMAL KINGDOMS by saying that the plant lives on *unorganized* materials, especially carbonic acid, water, ammonia and salts, organizing them and evolving oxygen, while the animal lives upon *organized* materials taking up oxygen and evolving carbonic acid. The animal cannot produce the complicated chemical compounds it needs for its structure, the plant can do so. Without sunlight the plant cannot grow or assimilate carbon and eliminate oxygen; without vegetables the animal cannot live. Thus, in literal truth as well as in ancient fable, we are the children of the sun.

Abandoning the VEGETABLE KINGDOM with all its marvels and beauties to the BOTANIST, let us confine ourselves to the ANIMAL KINGDOM, to creatures which live and move and feel.

It is at once obvious that the number of living beings which swarm on the earth, in the air, in the water, is so vast and enormous that some

classification is absolutely necessary if we wish to acquire a clear knowledge of the Animal Kingdom as a whole. The simplest system of classification is that named *morphological* (from the Greek words *morphe* form, and *logos* science), by which animals that are constructed on the same plan are placed in the same group. The first grand division we make is between animals that have a backbone, the VERTEBRATA, and animals that have no backbone, the INVERTEBRATA.

THE INVERTEBRATA are divided into five sub-kingdoms: PROTOZOA, structureless jelly-like creatures of minute size; CœLEENTERATA, animals without a heart or nervous system, such as the ordinary "Sea Nettle"; ANNULOIDA, a class which contains the "Star-fishes" and "Tape-worms"; ANNULOSA, animals composed of different segments arranged one behind the other; to this sub-kingdom belong forms so widely different to the eyes of the superficial observer as "Earth-worms," "Lobsters," "Spiders," "Bees" and "Butterflies." Lastly, the MOLLUSCA, of which the best known are the "Oyster" and the "Snail."

The VERTEBRATA are so-called from the Latin word *vertebra* (joint of the backbone), and possess a backbone made of many parts joined together. Each joint consists of a central portion which helps to give rigidity to the body and support to the limbs. On the upper part of this central portion are certain projections, called in technical language *processes*, that form a protection to the spinal cord; on the lower part are similar processes which cover the great descending artery. The joints of this backbone from the top of the neck to the end of the tail are made up of similar parts. In the neck we do not find ribs, but the rudiments of ribs. In the back the lower bony processes are elongated into ribs; in the loins the processes again degenerate; in the haunches they become confluent with bones that form a cylindrical covering for the softer vessels, and offer a strong fulcrum for the lower limbs. Nay more, the skull is made up of parts corresponding to four vertebræ.

The nervous system of the Vertebrates consist of the *brain*, enclosed in the bony cavity of the skull, and the *spinal cord*, whence spring at intervals symmetrical pairs of nerves distributed to the voluntary muscles. The organs of sense become more perfect, the eyes are invariably two in number, and sagacity is developed in proportion as the nervous centres expand. The blood is red, and the temperature of the body higher than that of the surrounding medium. But this temperature differs so much

CHAPTER II.

THE CLASS MAMMALIA—GENERAL CHARACTERISTICS—THE "DENTAL FORMULA"—
DIVISION INTO ORDERS.

THE name MAMMALIA is derived from the Latin word *mamma*, "a teat," and signifies animals that have teats. The possession of these organs constitutes the most apparent and decisive distinction between the Mammalia and the other classes of animals. They alone bring forth their young alive and suckle them with their milk. The fishes cast their spawn upon the waters, careless of their future offspring. The reptile leaves its eggs to be hatched by the sun's ray, and so far exercises some degree of forethought for its posterity. The bird sits patiently on her nest till her fledglings appear from the egg, and then tenderly watches over them, feeds them, and gathers them under her wings. But the mammal brings forth her young alive, and nourishes them at the living fountain of her breast.

While all mammals possess teats, the number and position of them vary. Some, like the cow, have them on the belly; some, like man, have them on the breast; some, like the sow, have them on both. In general, the number of these teats corresponds to the number of young each animal bears at a birth.

The Mammalia vary greatly in size. How enormous is the difference in this respect between the elephant and the mouse, or between the whale and the bat, between the giraffe and the mole. Yet all are constructed on the same plan. In all the vertebrates, as we have said, the skull consists of modifications and developments of parts corresponding to four vertebræ; in all the mammalia the number of the neck vertebræ are the same. Seven vertebræ form the neck of the giraffe as well as that of the seemingly neckless whale. In birds, on the contrary, the number of vertebræ increase with the length of the neck. The vertebræ in the back vary in number from ten to twenty-three, the commonest number being thirteen; man, however, has only twelve. The vertebræ

in the loins are commonly seven ; man possesses five, but some animals have as many as nine or as few as two. The sacral vertebræ are amalgamated in most cases into a single bone, and the vertebræ of the tail vary from four to forty-six in number, and are usually freely movable on each other. The number of ribs varies with the number of the *dorsal* or back vertebræ.

The limbs are the members in which the greatest differences are seen. The regular number is four, and hence this class, the mammalia, are sometimes called Quadrupeds, or four-footed things. We must remember, however, that many reptiles walk on four legs, and that in some genera of mammalia the hind limbs are either wanting or entirely rudimentary. The fore-limbs also exhibit striking differences in the various classes ; the hand in the ape becomes in the cat a paw, and in the horse a single hoof ; the fingers in one animal are five in number, in another only one is found.

This skeleton, this bony framework, is moved by muscles which lie close to the bones and move them in diverse directions. To describe the muscular or other tissues is the function of the anatomists, and whoever desires to have a perfect knowledge of their wonderful constitution must consult some treatise on Anatomy. Such descriptions are out of place here ; it is sufficient for us to remark that the muscles stand in the strictest harmony with the peculiarities of the skeleton and the animal's mode of life, which mode of life both influences and is influenced by the figure of the animal. In some, one muscle is wanting, in others, another ; the whales, for example, have no neck muscles, the apes have them developed as in men. Animals that climb, or burrow, or fly, or prey, have immense muscles to the upper arm ; those that run have immense muscles of the rump and shoulder. In brief, each creature is provided as befits its mode of life, or its mode of life has developed the fitting provision.

A like variation is seen in the organs of nutrition. The mouth with fleshy, sensitive lips is a characteristic feature of all except the small order of the *Monotremata*. The *teeth* vary remarkably both in number and shape. Like the hoof or foot, the teeth are admirably adapted in the case of each species to enable it to support its existence ; and hence these two features form a convenient basis for classification. Teeth indeed are wanting in the scaly and great ant-eaters, and are found in the whale only before it is born, but the great majority of mammals

possess teeth invariably planted in distinct sockets in the jaw; in most cases the young animal has *milk teeth*, which are ultimately succeeded by *permanent teeth*. In man the teeth may be divided into four groups: the *incisors* or cutting teeth in front, the *canine* or eye-teeth, the *false molars*, and the back teeth or *molars*. The number of teeth in any animal is usually expressed by what is called the "Dental Formula." We know that in each half of each jaw there is a like number of teeth; hence we have in man the "dental formula" as follows:

$$\text{I. } \frac{2-2}{2-2}, \text{ C. } \frac{1-1}{1-1}, \text{ F. M. } \frac{2-2}{2-2}, \text{ M. } \frac{3-3}{3-3} = 32;$$

where I. denotes *incisors*; C., *canine*; F. M., *false molars*; M., *true molars*; the figures above the line the number of teeth in the upper jaw; those in the lower line, in the lower jaw; the first numbers in each group, the teeth in the left; the second ones, the teeth in the right jaw; the final figures, the total number of teeth in the mouth. The same dental formula is given for the chimpanzee, but what a difference it presents to that of the ruminant or cud-chewing animal! The dental formula of the sheep, for example, is

$$\text{I. } \frac{0-0}{3-3}, \text{ C. } \frac{0-0}{1-1}, \text{ F. M. } \frac{3-3}{3-3}, \text{ M. } \frac{3-3}{3-3} = 32.$$

Thus we see at a glance that while the sheep has as many teeth as ourselves, they are widely different from ours in position. In the upper jaw the incisors and canines are wanting; the false molars are three in each side, while we have but two; the molars in both jaws are as numerous as our own; in the lower jaw there are three incisors on each side against our two, and the same number of canines as we possess.

In the *Carnivora*, or flesh-eating animals, the molars assume a cutting character, while in those that feed on herbage, the *Herbivora*, the molar structure prevails. In the *Rodentia*, or gnawing animals, such as rats or squirrels, the incisors project forward and are continually growing; in the *elephant* there are no lower incisors, but the upper incisors, two in number, grow into enormous tusks. In the adult *whale*, the teeth are replaced by the whalebone plates.

The digestive organs of the Mammalia do not differ to any great extent. They possess one stomach with the exception of the *Ruminantia*, or cud-chewers, which have four, the first three of which are so arranged

as to allow the food to be returned with ease into the mouth. The intestines vary in length considerably. In the *Carnivora*, or flesh-eaters, their length is only three or four times the length of the animal's body ; in the *Herbivora*, or grass-eaters, they are from twelve to twenty-eight times their length. It is worthy of notice, as indicating how a change in structure may be developed by change of food and habits, that the intestines of the common cat whom domestic life has accustomed to a less carnivorous diet, are longer than those of its wild and bloody kindred.

The heart of the Mammalia is a double heart, consisting of two auricles and two ventricles, which are provided with valves so arranged that the blood can flow from the auricle into the ventricle, but not from the ventricle to the auricle. The course of the blood through this organ may be briefly described. The venous blood that has become impure in the tissues is returned by them to the right auricle, and is then discharged into the right ventricle. The powerful muscles of the heart thence propel it to the lungs, where it meets the air taken in by respiration and is changed into arterial blood. From the lungs it is drawn back into the left auricle, passes into the left ventricle, and is thence forced through the arteries to all parts of the body, and then by means of the exceedingly fine vessels called capillaries, passes again once more into the veins.

Venous blood is changed into arterial blood in the lungs, where it absorbs the oxygen of the air. The *lungs* are two in number, one on each side of the chest, and communicate by the bronchial tubes and the *trachea*, or windpipe, with the outer air. The windpipe we can all feel in the front of our necks ; it divides in the chest into the two bronchial tubes, and they are subdivided into an infinite number of little rootlets that enter into the substance of the lung.

The air is taken into and discharged from the lungs by the operation of breathing ; and breathing is effected by the elevation and depression of the ribs and the contraction and relaxation of the flat, powerful muscular partition which separates the cavity containing the stomach and the intestines from the chest, which contains the heart and lungs. The air we inhale enters the lungs laden with oxygen ; the air we exhale leaves them laden with carbonic acid gas.

The *blood*, which the lungs renew and the heart distributes, is of a light red color. It is the substance which animates the whole being, and from which all the complex structures of the body are formed. Blood

when freshly-drawn is of a uniform appearance; if it is allowed to stand, a dark red mass called the clot rises to the surface, the fluid below, named *serum*, becomes colorless. This process of coagulation occupies about twenty minutes, and during it a peculiar odor is emitted. The upper part of the clot is covered with a film of fibrous matter called *fibrin*; the remainder consists of myriads of small, round bodies called corpuscles, which can be readily seen by examining a drop of blood under the microscope. These blood corpuscles are *circular* in the Mammalia, while in the other Vertebrates they are elliptical, and even in the class of Mammalia the distinction between the blood of the various orders is so marked as to enable a practised eye to indicate the kind of animal from which it has been taken.

Under the microscope the blood corpuscles are seen to consist of two classes, red and colorless corpuscles; and Huxley writes, "The invertebrate animals which have true blood corpuscles, possess only such as resemble the colorless corpuscles of man. The lowest vertebrate animals possess only colorless corpuscles. Vertebrate animals, the young of which are born from eggs, have two kinds of corpuscles, colorless ones and red ones, oval in shape and possessing a nucleus. All the animals which suckle the young (the Mammalia) have, like man, two kinds of corpuscles, colorless ones and small colored corpuscles, the latter being always flattened and devoid of any nucleus. They are usually circular, but in the camel tribe they are elliptical. In the vertebrate series the colorless corpuscles differ much less from one another in size and form than the colored. The latter are smallest in the little musk deer, in which animal they are about a quarter as large as those of a man. On the other hand, the red corpuscles are largest in the Amphibia, in some of which animals they are ten times as long as in man." The blood is the product not of one organ, but of all; and it is profoundly affected by the circumstance that every part of the body takes something from the blood and pours something into it. "The blood may be compared to a river, the nature of which is determined by that of the head-waters, and by that of the animals which swim in it, but which is also much affected by the soil over which it flows, by the water-weeds which cover its banks, and by affluents from distant regions, by irrigation works which are supplied from it, and by drain-pipes which flow into it."

We have gone somewhat fully into detail respecting the blood, because "the Blood is the Life."

The teats or *mammæ* from which this class derives its technical name, are supplied with the milk which supports the young by glands consisting of bunches of tiny cells. These by means of very small tubes pour their secretions into larger vessels, which unite into five or six principal vessels, that are capable of enlargement according to the amount of milk which they are called upon to hold. These reservoirs become smaller towards the mamma or teat, and serve as tubes for the conveyance of the milk into the mouth of the young.

As regards the *organs of sense*, that of sight is perhaps more highly developed in birds than in any other class of animals, but the others are generally most highly developed in the Mammalia. Especially is this the case with the sense of touch, which reaches its highest delicacy in the human hand. The sense of taste varies according as the animal is HERBIVOROUS, CARNIVOROUS, or INSECTIVOROUS.

These various senses convey intelligence of the external world to the brain, and from the brain the voluntary muscles receive their orders to exercise their various functions. The brain which receives this intelligence and issues these directions, together with the multitudinous channels through which they are conveyed, belongs to the *Nervous System*. From the great nerve mass, the *brain*, protected by the bony armor of the skull, there runs the great cord of nervous matter, the spinal cord, which, defended by the vertebræ, extends along the back, giving out branches of various sizes. These *nerves* are composed of fibres, and those fibres which form the anterior root of a nerve give rise to motion, and those which form the posterior root give rise to sensation. This nervous system, then, not only enables us to move our bodies and to know what is going on in the external world, but enables us to discriminate nutritious from innutritious matters, tells us when food is needed, gives us the power to seize and kill, guides the hand to the mouth or the mouth to the food, and governs all the movements of the jaws and of the alimentary canal—it rules the vital actions.

The *brain* varies considerably in size; in some Mammalia it resembles the brain of birds, but as we rise in the scale it quickly changes from the less to the more perfect, and displays convolutions which in number and extent are proportionate to the intelligence of the animal.

The intelligence of man and the intelligence of the brute creation have been distinguished by the names of *Reason* and *Instinct* respectively. A distinction like this is convenient, and unobjectionable if we remem-

ber that it implies only difference in the degree, not in the kind of intelligence. Animals possess memory, can distinguish objects, have perceptions of time, place, color and sound; can learn, apprehend, judge and conclude. Like man, they learn by experience, they perceive danger and devise means to avoid it, they like and dislike, love their friends and benefactors, hate their enemies and ill-doers; they exhibit gratitude, loyalty, respect and contempt, anger and gentleness, cunning and sagacity, deceitfulness and honesty; some think before they act, some stake life and liberty to gratify their impulses. Animals comprehend the benefits of association, and sacrifice themselves for the good of their society; they tend their sick, support the weak, divide their food with the hungry; they can subdue their desires and passions, and have an independent will. They can recall the past, and forecast the future, for which they save and provide. In character, too, animals differ widely. They are daring or timid, bold or cowardly, open or sly, proud or humble, trusting or suspicious, docile or stupid, servile and tyrannous, lovers of peace or lovers of strife, merry or sad, joyous or melancholy, fond of or averse to society, friends to each other or foes of all the world.

Their characters are altered and their faculties developed by education. The horse, the dog, the ox, the elephant display, when tamed and trained by man, powers which their wild kindred never exhibit.

The *Geographical distribution* of animals has attracted much attention, but any detailed classification of animals according to their location would, we think, be needless in this work. We may remark generally, that the *Quadrumana* inhabit the Tropics, but the families in the Western Hemisphere are different from those that dwell in the Eastern; the *Marsupials* are most abundant in Australia, with some genera in America. There are no *Edentata* in Europe, nor any native *Ruminantia* in Australia. The *Cheiroptera*, *Carnivora*, *Rodentia*, and *Cetacea* are citizens of the world.

We have not yet spoken of the external covering of most tribes of Mammalia. Their coats vary both in color and thickness according to the dwelling-places and habits of the wearer; from the stripes of the tiger to the white fur of the polar bear. This external coat consists of *hair*, which in the sheep becomes wool, in the swine bristles, in the hedgehog prickles, in the porcupine quills; the scales, nails and horns which some orders possess are formed by the close contact of the roots of the hair, whose horny filaments join firmly together and compose solid

flakes. As a general rule, the coat falls off in spring or autumn and is replaced by new hair.

In one very striking point, *the voice*, the Mammalia are far inferior to the birds. Man, indeed, possesses a voice that can produce articulate and melodious sounds, but his fellow mammals are a tuneless and songless race, and their tones have no charm for us. The voice of most of them is disagreeable, and becomes more so when the animal is excited. Love, which bids the bird warble its melodious lays, only makes the voice of the mammal more unpleasing. Compare the notes of our feathered denizens of the air and the amatory serenades of the domestic cat. We admire indeed the poet's verse that tells us how

"The lowing herd winds slowly o'er the lea,"

but we admire it as a picture of evening; it is not the "lowing," but the idea of return from labor that please us. "Lowing" in itself is as inharmonious as the bleating of sheep, the grunting of swine, the braying of the ass. The voice of all mammals, excepting man, is rough, dissonant, devoid of flexibility, and not susceptible of cultivation.

We must now proceed to enumerate the *orders* into which all the animals comprehended in the *class* MAMMALIA are divided. Without such a further classification we should be in a labyrinth "in endless mazes lost." We will, however, first give as briefly as possible a definition of the *class*.

"The MAMMALIA form a class of VERTEBRATE animals. They bring forth their young alive and nourish them with milk. They breathe by means of lungs; their heart is four-chambered; the appendages to the skin take the form of hair."

The basis of classification of the Mammalia has been a subject of frequent discussion. The first and most obvious division is into PLACENTAL and NON-PLACENTAL Mammals; in the former the unborn young are nourished by means of the *placenta*, and are not born till they are able to obtain their natural food, milk, by their own exertions. In the latter, the young are born before there is any necessity for a placenta to supply them with the nutrient materials of the mother's blood; they are born so helpless that they cannot suck, but the milk is forced into their mouths by a muscle surrounding the mammary gland. But these grand divisions are too large, for the class of placental mammals embraces animals so diverse as man and whales, bats and elephants,

sheep and tigers. Commencing, then, with the creatures most like man, we arrange our ORDERS in a descending scale. The technical Latin names will be explained at the beginning of our account of each order.

CLASS MAMMALIA.

PLACENTAL DIVISION.

ORDER I.—QUADRUMANA.	ORDER VII.—UNGULATA.
II.—CHEIROPTERA.	VIII.—PROBOSCIDEA.
III.—INSECTIVORA.	IX.—HYRACOIDEA.
IV.—CARNIVORA.	X.—RODENTIA.
V.—CETACEA.	XI.—EDENTATA.
VI.—SIRENIA.	

NON-PLACENTAL DIVISION.

ORDER XII.—MARSUPIALIA.	ORDER XIII.—MONOTREMATA.
-------------------------	--------------------------

The above arrangement is in accordance with the conclusions of the most eminent naturalists of the present day, and is undoubtedly the most convenient for a popular exposition of the Natural History of the Mammalia. We may mention, however, that many scientific writers separate the *Ruminantia* from the *Ungulata*, that some form *Ruminantia*, *Ungulata* and *Proboscidea*, and some only the two latter, into an order called PACHYDERMATA.



ORDER I.

QUADRUMANA.

QUADRUMANA OR PRIMATES.

I.—ANTHROPOIDEA.

1. SIMIADÆ - - - - - ANTHROPOID APES.
2. SEMNOPITHECIDÆ - - - OLD WORLD MONKEYS.
3. CYNOPITHECIDÆ - - - BABOONS AND MACAQUES.
4. CEBIDÆ - - - - - NEW WORLD MONKEYS.
5. HAPALIDÆ - - - - - MARMOSETS.

II.—LEMUROIDEA.

6. LEMURIDÆ - - - - - LEMURS.
7. TARSIIDÆ - - - - - TARSIIERS.
8. CHEIROMYIDÆ - - - - - AYE-AYES.

QUADRUMANA

CHAPTER III.

THE GENERAL CHARACTERISTICS OF QUADRUMANA—THEIR HABITS IN THEIR NATIVE HAUNTS—THEIR GREGARIOUS DISPOSITION—DIVISION OF THE QUADRUMANA.

THE word *Quadrumana* is formed from two Latin words, *quattuor*, "four," and *manus*, "a hand," and means, therefore, "four-handed." To this order belong all the monkey tribes; and a comparison of the foot of a monkey with that of a man will indicate the reason why they are called "four-handed," while man is called in scientific language a *bimanous* (from the Latin *binus*, "two," and *mannus*, a "hand"), or two-handed animal. In man the upper limbs terminate in a hand consisting of four fingers and a thumb, which thumb is capable of being "opposed" to each of the fingers. By "opposed" is meant that the thumb is so adjusted as to grasp objects between itself and the fingers. This arrangement is extended in the *Quadrumana* to the hind limbs; the inner or great toe is opposable to the other toes, the hind feet become hands and can grasp objects as easily and firmly as the human hand does. Such a construction enables the animals possessing it to climb with ease, and hence we find that the favorite home of this order is in the woods and forests of the warmer regions of the two hemispheres.

From the very earliest ages the extraordinary resemblance of the monkey tribes to man has attracted the curiosity of mankind. The ancient Egyptians sculptured their forms on their granite monuments, and revered some species as gods. The modern Arabs regard them as the progeny of the evil one, for whom nothing is sacred, nothing venerable, who have been cursed since the day when God changed them from man into apes, and who still bear in strange combination the form of the devil and of man. We of the present day look upon them with mixed feelings. The caricature of the human form and human faculties which they exhibit is tolerable to us in the smaller, playful species,

abhorrent in the larger, wilder kinds. They are at once too like and too unlike ourselves. Like man, they can stand upright; like man, they have hands, a hairless face, and eyes looking directly forward. Yet even these hands, so like ours to the ordinary eye, are not the admirable instrument possessed by man; the thumb is shorter and more widely separated from the fingers, and the fingers cannot act separately like a man's. The haggard, hairy body, the long arms, the thin, calfless legs, the small, receding skull, and the thin, in-drawn lips, are all characteristics of the ape, the very opposite of those found in man.

Morally as well as physically, the apes constitute the "seamy side" of man. They are malicious, cunning, sensual, greedy, thievish, easily provoked to rage, and have human vices and defects. But they are not without what we name virtues. They are sagacious, cheerful, social, devotedly fond of their offspring, and display striking compassion towards the sick and weak. Intellectually they are neither so much higher than other animals, nor so much lower than man, as is commonly maintained. The possession of a hand gives them great advantages over the rest of the animal kingdom, they have a strong tendency for imitating, and are easily taught actions which no other animals can perform. And if we compare the mental qualities of the ape with those of the dog, to the disadvantage of the former, we must remember that man has been for thousands of years training and educating the dog, while the ape has had no opportunity of enjoying the elevating society of mankind. Taking this circumstance into account, we must recognize the ape as the most sagacious of beasts. Yet he is deceived and out-tricked with ease: his passions conquer his prudence. The Malays make a small hole in a gourd, and then place in the interior sugar or some fruits that apes love. The ape inserts its hand through the narrow opening, grasps a handful, and finds that it cannot be withdrawn again; it allows itself to be captured rather than lose its grasp on the dainties it has seized.

The apes are the most agile and active of the Mammalia. When on a raid for food they are not at rest for a moment. They devour every species of food—fruits, roots, bulbs, corn, nuts and leaves—and insects, eggs, and young birds form the delicacies of their repasts. In search of provender their bands spread through the forests; even the elephant dares not invade the spots where the ape is foraging. But while jealous of guarding what they consider their own right, the rogues care not for the rights of others. "We sow, the apes reap," is a proverb in the

Soudan. Fields and gardens especially suffer; neither lock nor bolt, neither hedge nor wall can keep out the plunderers, who destroy much more than they consume. To an unconcerned spectator, the sight of an incursion of apes is an amusing spectacle. They run, they leap, they climb, they swim, they perform in the branches of the trees astounding feats of agility and acrobatic skill. Some seem to fly from bough to bough; a space of six or seven yards across is a mere trifle; they will drop ten feet or more perpendicularly to a branch; it bends with the weight, and as it springs back again, the ape lets go and is shot off by the recoil like an arrow from the bow. Every climbing plant is a ladder, every tree is a high-road. Head foremost, tail foremost, up and down they go as if on solid ground. If a branch breaks, they lay hold of another; if their hands fail, their hand-like feet succeed, or if both fail to grasp, the apes of this continent hold on by their tails. The American monkeys make the tail a fifth hand, or rather their first, most-used hand; they hang by it, they rock themselves by it, they swing by it; their tail is their hammock when they take their noon-day sleep.

This agility and grace of motion are confined to their actions when climbing; their walk is awkward; even the largest manlike apes can scarcely be said to walk; some put down the whole soles of their feet, others support themselves on the knuckles of the hand and swing the body forward in such a fashion that the feet come between the hands. This incapacity of attaining to a walk such as man has, arises partly from the fact that in the ape the orifice by which the spinal cord enters the skull is set very far back, thus overbalancing the body, partly from the conformation of the hind feet. These, as we have said, are like hands, and the outstretched, separate thumb cannot furnish such a firm support for the body as the great toe does, especially as the creature usually walks on the outside of its foot. The Gorilla goes upright most easily, and the Tschego shares this faculty. Many other species can maintain an upright position for a time, but they sink down, when no longer able to balance themselves, on their fore-limbs; when pursued by the hunter, or pursuing their own foes, they move on all-fours.

Some tribes of apes swim excellently, others sink like lead; the latter have a great dread of water. Many travelers describe how the Brazilian monkeys form an ingenious bridge over rivers. A number of them climb to a high branch on a tree on the bank of the river they wish to cross. One monkey grasps the branch with his tail, and seizes with his hands

his neighbor's tail; the second monkey seizes the tail of a third, and so on till a chain of monkeys from the branch to the ground is formed. This chain is then set swinging by the lowest monkey; at every oscillation a fresh impulse is given it, and higher and higher does the end monkey swing, till at last he grasps a branch on the opposite bank of the stream. Across this primitive suspension-bridge the young and old members of the band pass; when all have crossed, the first monkey uncurls his tail, and the chain swings from the last monkey to the land on the other bank. It is a pity that there is no truth in this fable.

Apes are social animals; very few are solitary; they usually gather into bands. Each band has its own home, a spot of greater or less extent, and fixes its home where food is most easily procured. When they have settled on their location, they organize themselves. The strongest, or oldest, or most capable of the males becomes their leader. The dignity is conferred not by the suffrage of the people, but by victory in a series of conflicts with every other male. The strongest arm and the longest teeth decide better than an Electoral Commission. The leader enforces implicit obedience and enjoys great privileges; he claims and exacts the love of all the female members of his band, and woe to maid or matron who dares to flirt with any young monkey. No chivalrous respect for the fair sex restrains the despot from letting his erring spouse feel the weight of his hand; the gallant comes off still worse, for no trifling is permitted in love affairs. The leader is literally the "father of his people." When the band becomes too numerous for its home, some bold youth becomes the leader of a secession, and fights his way, in a new location, to supremacy in power and monopoly in love. Naturally, not a day passes that is not signalized by some conflict for some attractive dame, or by some assertion of his power by the leader.

The leader discharges his office nobly. Secure in his position, he enjoys the esteem and flattery of his subjects: the ladies vie with each other in delicate attentions, and in scratching and cleaning his hairy skin, an operation he submits to with the air of a pasha amid the slaves of his harem.

The sounds of which the ape is capable are well marked and numerous. The cry of terror, which is a warning for flight, is peculiarly remarkable. It is difficult to describe or imitate; it consists of a series of short, abrupt, tremulous tones, and when it is heard, the whole troop takes flight; the mothers call together their little ones, which cling fast

to her, and hurry with their burdens to the nearest tree or rock. The leader marches in front and indicates the path to be taken; not till he announces that all danger is over, does the herd gather again and return to resume their foraging.

All apes do not fly from their enemies; the larger ones face the most savage beasts of prey, and man himself. They fight with hands and teeth in most cases, but have been known to employ as weapons broken limbs of trees, and to hurl stones and fruit at their foes. Even to a man armed with a musket the Gorilla is a dangerous opponent.

In captivity, almost all kinds of apes live in harmony together, but they form for themselves a government resembling that of their days of freedom—the strongest rules.

The females bear one or two young ones. This is regularly a small, hideous creature; its limbs are longer in proportion than those of the adult; its face, with its folds and wrinkles, is more like that of an old man than a child. But its mother loves and tends it with touching care; the whole attitude and manner of the mother and child are strikingly human as she presses her offspring fondly to her breast, while it flings its arms about her neck, as she dandles it up and down in both hands, or rocks it to sleep on her bosom. As soon as it can go alone, it is allowed to play with other monkey infants, but the mother keeps her eye on it, follows every step, every movement, and at the first symptom of danger rushes towards it uttering her cry of warning and recall. If it disobeys her she boxes its ears; but this punishment is seldom required, for the monkey child is an example to the human child, and rarely requires speaking to twice. She divides her food with it, and instances have been known where she has died of grief at its loss. If a mother dies, some female of the band adopts the orphan and displays towards it a tenderness equal to that with which she treats her own offspring.

It is not ascertained how long, on the average, apes are in arriving at maturity. In accordance with all analogy, the larger are slower in growth than the lesser. The American species probably attain their full growth in three or four years; the baboons in eight to twelve years; the anthropoid or manlike apes, such as the Gorilla, Chimpanzee and Orang-outan, much later, as they shed their teeth at about the same age as children. We know nothing of the sicknesses from which they suffer when at liberty, nor how long they live; in all probability the manlike apes live as long as man. In captivity, the climate of Europe

seems fatal to most species, and the poor beast dies of consumption. A sick ape is a sight to move the hardest heart. All his merry tricks are gone; he sits sad and sorrowful, looking piteously at the faces of his sympathizing visitors. The nearer he approaches his end the gentler he becomes. All the brute seems to leave him; a higher spirit seems to shine out. He is grateful for every attention, soon recognizes the physician as his benefactor, takes his medicine willingly, and without reluctance submits to surgical operations.

In their native country the apes are more destructive than useful. Some tribes of savages eat their flesh and make their skins into leather, but they do not minister in any other way to the wants of man.

The above general description is drawn, of course, from observation of the best known species, and due allowance must be made in many cases for the exaggeration of travelers, and in many cases for our ignorance.

The QUADRUMANA are divided by many writers into three sections, which are separated from each other by their geographical position and their anatomical peculiarities. The basis of this classification is the animal's face, or rather its nose. The first section contains the *Catarrhini* or "the straight-nosed," the second the *Platyrrhini* or "flat-nosed" apes, the third the *Strepsirrhini* or "twisted-nosed" Lemuridæ.

The CATARRHINI have the same dental formula (see p. 8) as man, have either no tail or a non-prehensile one, and the thumbs of all the feet are truly opposable. They all belong, with one trifling exception, to Asia and Africa, and include the ANTHROPOID or "man-like" apes.



CHAPTER IV.

THE ANTHROPOID APES.

THE AFRICAN DIVISION—THE GENUS TROGLODYTES—THE GORILLA—THE CHIMPANZEE—THE ASIATIC DIVISION—THE GENUS SIMIA—ORANG-OUTAN—THE GENUS HYLOBATES OR GIBBON.

HUXLEY remarks that whatever system of classification is adopted, the Anthropoid apes are less widely separated from man than from the lower races of apes. The body is strikingly like the human form, the front limbs being longer, the hinder ones shorter than ours; the position of the eyes and ears is the same as in man; the body is covered thinly with hair, except the face and the inside of the feet, which parts are bare; they have no tail. Among the man-like apes, the first place must be assigned to the huge and terrible inhabitant of Western Africa, the Gorilla.

I.—GENUS TROGLODYTES.

The GORILLA, *Troglodytes Gorilla*, (Plate I.)—More than two thousand two hundred years ago, a Carthaginian fleet set sail from the Mediterranean to explore the coast of Africa. The commander of the fleet, Hanno, left an account of his voyage, and we possess a Greek translation of his work. He describes how he passed the present district of Sierra Leone, and then continues: "On the third day, when we had sailed thence and passed the fire-stream, we came to the South horn. In the bottom of the bay formed by this promontory was an island, with a lake in which was an island where we found some wild men. The majority were females with hairy bodies, and our interpreter called them Gerillas. We could not catch any males; they escaped easily by clambering up and down the precipices, and defended themselves by hurling fragments of rock. We caught three females, but could not

bring them away because they bit and scratched. We were forced to kill them, but we flayed the bodies and sent the skins to Carthage." To this account, Pliny adds that the skins were preserved in the temple of Juno.

It is clear from the above extract from Hanno's log-book, that he had seen Anthropoid apes, and the name he uses is conveniently applied to the species we are describing.

The Gorilla, called by the present natives Njina, represents a distinct species. It is shorter but far broader than even a stout man. A full-grown male attains the height of about five feet five inches, and measures from shoulder to shoulder nearly thirty-eight inches. The length and strength of the fore-limbs, the disproportionate size of the hands and feet, and the connection by a skin of the middle fingers and toes, are the most marked characteristics.

The neck of this animal is so short that its head appears to be buried between its shoulders. The forehead is retreating. The ears are small, and nearly on a line with the eyes. The nose is flat, but a little more salient than in the other monkeys. The chest and shoulders are extremely wide. The abdomen is round and prominent. There is no swell in the upper arm muscles, the lower limbs have no calves; the hands are massive and thick, and the fingers short and stumpy. The back of the hands is hairy; the finger-nails are black, thick, and strong. The foot is proportioned like the hand of a giant, and is well adapted for maintaining the body in a vertical position. The huge body is covered with iron-gray hairs, each ringed with alternate bands of black and gray. On the arms the hair is darker and longer, and sometimes exceeds two inches in length. The head is covered with a crown of short, reddish hair descending to the neck. The hair of the female is black with a red tint, and is not streaked like that of the male; neither has the female the red-colored crown until she is aged. The young Gorilla is of a jet-black color. The eyes are buried beneath prominent and shaggy eyebrows, an arrangement which gives the face a cruel look. The jaws are enormous, and furnished with large canine teeth.

It is not yet ascertained how large a tract of country the Gorilla inhabits; the interior of that part of Africa is not yet thoroughly explored, but we may safely say that the Gorilla is found between the equator and the fifth degree of north latitude, and that the forests traversed by the rivers Gaboon Moonee and Fernando Vaz form its abode.

Battell, towards the end of the sixteenth century, describes two monstrous apes, which he names the Pongo and the Ensego. Another traveler calls by the name Impungoo "this monstrous production of Nature, which grows to the height of from seven to nine feet." In 1846, we began to receive more authentic accounts of this gigantic ape. The Reverend Mr. Leighton Wilson of New York, a missionary at the Gaboons, saw a dead Gorilla and obtained a skull, which he forwarded to Dr. Savage. The same missionary procured another skull and part of a skeleton, which he presented to the Natural History Society of Boston, Mass. In 1852, Ford gave accounts agreeing in all points with those of the gentlemen just mentioned; and finally, in 1867, Du Chaillu's great book, "Equatorial Africa," appeared. He tells how the king of the African forests stood suddenly before him, with his powerful chest, his mighty arms, his glittering eyes, and a countenance with a truly hellish expression. He stood and beat his breast with his huge hands till it echoed like a drum, while he uttered terrible roars. The eyes of the creature grew fiercer, his hair began to bristle, he showed his savage teeth and repeated his thundering roar. He came within ten steps of the intrepid traveler, and roared; he came nearer, and again drummed on his echoing breast. When he was six paces distant Du Chaillu fired, and the creature, with a groan awfully human and yet thoroughly brutal, fell dead on his face. The limbs quivered for a few minutes, then all was still. Whatever suspicion Du Chaillu's passion for fine writing may have at first aroused, it is now agreed that his account of the Gorilla is trustworthy. He agrees with the celebrated English philosopher, Owen, in placing it in the scale of animals next to man, and adds that, in hunting the Gorilla, "I have never been able to maintain the indifference, much less experience the triumphant joy of a hunter. It always seemed as if a fellow-creature, a monstrous one it is true, but still having about it something human, was my victim. It was a delusion; I knew it, but yet the feeling was stronger than myself."

The Gorilla lives in the loneliest and darkest spots of the dense African forest, preferring for his residence deep valleys, or rugged and rocky heights in the neighborhood of water. It is a restless animal, seldom two days together in the same place. This wandering is rendered necessary by the difficulty of procuring food; for although the Gorilla has enormous canines and is said to hunt the lion, it really is exclusively a feeder on plants. Its favorite food is fruit, nuts, banana

leaves; and when it has laid waste an extensive space in satisfying its enormous appetite, it goes elsewhere to seek a supply. It knows when certain regions are fruitful, owing to the changes of the seasons, and periodically visits them. It does not live in trees, and its huge size prevents it from leaping like the lesser monkeys from bough to bough; it only climbs to get food. Its favorite food is the wild sugar-cane, and a nut of exceeding hardness, which it crushes in its iron jaws. The young Gorilla, Du Chaillu thinks, sleep in trees, the older ones on the ground with their backs leaning against a trunk. The Gorilla is not social; they are found most often in pairs. If a solitary male is met he is vicious and dangerous. Young Gorillas associate in fours and fives. They run on all fours, and owing to their acuteness of hearing it is difficult to get near them. There is no evidence to prove that they ever build for themselves huts or shelter. The adult Gorilla is very wary, and the hunter may spend a whole day without seeing one. "When I have surprised a couple of Gorillas," says Du Chaillu, "the male has usually been seated on a rock or against a tree in the darkest corner of the jungle. The female sat eating beside him, and, what was very singular, it was nearly always she who gave alarm by taking to flight, uttering at the same time piercing cries. But the male remained seated for a moment, and knitting together his savage countenance, slowly stood upright. Throwing a malicious glance at the invaders of his retreat, he then commenced to beat his breast, to elevate his great head, and to utter his formidable roars. The hideous aspect of the animal at this moment it is impossible to describe. Looking at him, I forgave my brave native hunters for being full of superstitious fears, and I ceased to be astonished at the strange and marvellous stories current among them with regard to the Gorillas."

The Gorilla does not make use of a stick as a weapon; it only uses in its assaults its arms, feet, and teeth. With a single blow of its foot, armed as it is with short, curved nails, it disembowels a man or fractures his skull. In attacking this ferocious animal, experienced hunters always reserve their shot until the last moment, for the report of firearms irritates the terrible beast, and if the wound is not fatal, the Gorilla flings itself with incredible violence on its aggressor, crushing at the same moment both weapon and hunter.

When it is attacked, it utters a short, jerking, and acute bark, like that of an angry dog; to this succeeds a low growling like distant thun-

der, which appears to come from the spacious cavities of the chest and abdomen rather than from the throat. The cry of the female and of the young is shrill and piercing.

The Gorilla dies as easily as man; a ball well-directed produces instant death.

The female does not attack the hunter; she flies with her little one, which clings around her neck with its legs encircling her body. The affection of these creatures for their young is so touching, so human, that white men have not the heart to kill them. The natives have no such scruples, and Du Chaillu saw some young Gorillas whose mothers had been slain. He himself had in his possession a young male about two to three years old and two feet and a half high. It was violent, fierce and quite untamable. It repeatedly broke out of its cage; neither hunger nor other means could conquer its obstinate love of liberty, and when it was at last secured by chains it died suddenly of a broken heart. A young female which was brought to him was a suckling, and died from want of milk. Winwood Reade states that he saw in captivity a young Gorilla and a young Chimpanzee, and that they were equally docile. He heard, too, a report that the Gorilla frequently pursued women who went any distance from a village, and saw a woman who affirmed that she had suffered from the violence of a Gorilla, and with difficulty escaped. He considers, however, that stories of captured women living with apes in the forests to which they had been dragged, are not deserving of implicit belief. Such stories are common in various places, and have this basis in fact that the larger male apes will undoubtedly assault women.

Specimens more or less imperfect exist in the Natural History collections at Boston and Philadelphia; no living Gorilla has ever been brought to America, and only one to Europe. The latter unfortunate animal died lately at Berlin from the effects of the climate.

THE CHIMPANZEE.

Wallace and others, differing from Owen and Du Chaillu, assign the highest rank among the apes to the CHIMPANZEE, *Troglodytes niger*, (Plate I.)—Its appearance is certainly not so bestial as that of the Gorilla or the Ourang-outan. The arms are shorter, the hands and feet are better formed, and it can more easily assume a vertical atti-

tude; the legs show a slight development of calf. It is smaller than the Gorilla, with a much shorter body; the head is proportionately large, the face broad and flat, the brow less receding than the Gorilla's; the nose is small, the mouth large with wrinkled lips. It has a pretty thick coat of moderately long hair, which becomes longer on the cheeks and the back of the head. The bare portions of the face are grayish-brown, the hands and feet like brown leather, the lips a dull red. The eyes are mild and soft, with a light-brown iris.

The Chimpanzee is found not only in the forests of Upper and Lower Guinea, but far in the interior of Africa. It usually lives in pairs and families; sometimes five are seen together; seldom more than ten, unless on some festive occasion, when as many as fifty assemble and amuse themselves by screaming and drumming on the old tree trunks. They build nests in the trees, and provide these nests with roofs to turn the rain. Rarely more than two of such nests are found together. The Chimpanzee is not a social ape.

When at rest the Chimpanzee assumes a sitting position; usually when discovered it is standing erect, but as soon as it perceives itself observed it drops on all fours and runs away, differing in this respect from the Gorilla which boldly faces the intruder on his privacy. It is an excellent climber and leaps from tree to tree with astonishing activity. A family group is often seen; the parents sit beneath the shade of a tree, eating and chattering, the little ones sport around and swing from bough to bough. Their food is usually fruits, nuts, leaves, or the bananas which the negroes plant in their cornfields.

Of all the man-like apes, the Chimpanzee is the best known and the most docile. Grandpret saw one that had been taught to attend to a cooking-stove, and call the cook when it was hot enough. The same ape worked with great intelligence on board ship, and hauled on, cast loose or made fast the ropes with all the skill of a sailor. Brosse brought a pair to Europe that ate at table, used a knife and fork, drank wine and spirits, called the waiter when they wanted anything, and grew angry at being neglected. The male had during a fit of sickness been bled by a surgeon; and ever afterwards when it felt indisposed, it held out its arm for the lancet. Lieutenant Sayers had a young one which was human enough to attempt suicide. On its master refusing to give it its favorite food, bananas, it rushed with its head against the wall so violently that it fell backwards; it then mounted on a chest, extended its arms with a

gesture of despair, and flung itself headlong down. The Lieutenant, fearing to lose it, gave way, and the creature gave lively testimony to its delight at its victory.

Buffon gives some interesting details regarding a young Chimpanzee which was brought to Paris in 1740. This animal offered its hand to lead people about who came to visit it; it promenaded with them in the gravest manner as if keeping them company; it sat at table, spread out its napkin, wiped its lips with it, and used its spoon and fork to carry food to its mouth; it poured out its drink into a glass by itself, hobnobbed when invited to do so; it would take a cup and saucer, put them on the table, put sugar in the cup, and pour tea over it, leave it to cool before drinking it, and all this without any other instigation than the signs or words of its master, and often even without this.

The Chimpanzee, writes Brehm, displays in all its actions so much that is human that we almost cease to regard it as a beast. Its intellect seems nearly on a par with that of the uneducated savage. It imitates whatever it sees just as a child does; it fails because its hand has not the capacity of the human hand, but its attempts are made consciously and with reflection. It knows its position, and cordially regards itself as higher than the other animals. It distinguishes between grown people and children, respecting the former, loving the latter, provided always they do not tease it. It expresses its feelings like men. It cannot laugh indeed, but it wrinkles up its face and assumes an unmistakable expression of pleasure. It proclaims its sorrows not only by gestures but by cries and wailing sounds that are intelligible to every one.

Of the many specimens which have been brought from their native homes, most have perished by disease of the lungs. Dr. Martini describes his visit to a sick Chimpanzee. "Covered up in its bed, it lay quite still with a deep expression of suffering on its countenance, shaken by paroxysms of coughing and at times turning its eyes upwards with sighs of pain. It was shy at first, but I soon gained its confidence. It was suffering from inflammation of the left lung accompanied with change of tissue in both lungs and a swelling of the lymphatic glands on both sides of the neck; a deep abscess pressed together the windpipe and the throat. I resolved to open the abscess. The state of the lungs forbade the use of chloroform; chloral hydrate produced a drowsiness, but not anæsthesia. He resisted all attempts at force by men. To my surprise, when my assistants retired he voluntarily submitted to an examination

of the abscess. I resolved to perform the operation. Seated on the knees of his keeper, the ape bent his head backwards and kept it quietly in that position. The incision was quickly made; the creature neither shrunk nor cried. Some thin purulent matter was pressed out, and his breathing was relieved. An unmistakable expression of pleasure and comfort spread over his face; he stretched out his hand to mine, and warmly embraced his keeper. The wound in the neck soon healed, but the inflammation of the lungs increased. He willingly and obediently took all the medicines prescribed for him, and displayed great gentleness and patience during his last hours. He died as a man dies."

A couple of Chimpanzees which were kept at the Jardin d'Acclimatation of Paris excited great attention. The following account of the behavior of the survivor is by an eye-witness:

"I have had an 'interview' with the most interesting widower that it has been my lot to meet in Paris. His poignant sorrow for his departed spouse and his deep affection for the baby she left behind called forth my warmest sympathy. This broken-hearted widower is a captive. His prison is an iron cage. He seems resigned to his lot, and seeks consolation in rendering kind offices to his little one, and in caressing it. The widower is a powerfully-built individual, eight feet high, and has most formidable fists, which he shuts like a prize-fighter. I do not exaggerate when I say that a comparison between his forehead and the foreheads of those who come to stare at him is not to their advantage. His cranium is nobly developed, being well arched at the top, and full in the anterior region. But the nose is flat, and the mouth and chin are prognate. You have already divined that I am speaking about the Chimpanzee at the Jardin d'Acclimatation and his bereaved baby, which sleeps with its head on the papa's arm, and keeps its own arm round his neck when it is awake. The senior animal, who has the advantage over his masters of having thumbs on his feet, has a trick of doubling the blanket which has been given him, and tucking it under the poor orphan. When weary of playing with a silky monkey, which has been turned into the cage to amuse the babe, it lies down to slumber. The father's eyes fill with tears as he watches the young thing, who seems to understand his unhappy position and to be in close sympathy with him. The female died eight days after the infant's birth. Her husband grew violent from despair when her corpse was thrown overboard, and he was placed upon low diet to weaken the prodigious

strength of his fists. Physically low as he now is, he can still bend up like a cane an iron rod an inch in diameter. I thought of Caracacus as I watched him in his prison. There is much dignity in his silent woe and resignation, and I fervently hope that he will never get into the hands of vivisectors."

THE BALD CHIMPANZEE.

The TSCHEGO or Nschiego Mbouvé, *Troglodytes calvus*, of Du Chaillu differs in many respects from the Chimpanzee. A female five years old in the Zoological Gardens at Dresden, is remarkable for a head much smaller in proportion than the Chimpanzee's; the body is longer, the shoulders broader, the loins finer, the chest rounder, the stomach less prominent than the corresponding parts of the Gorilla or Chimpanzee. The arms are long, but the hands very narrow and thin; the thumb is long and weak, the two middle fingers very strong; the legs are longer than those of the other manlike apes, the feet well formed. The eyebrows are shaggy and prominent; the eyes small, brown, lively, surrounded with wrinkles. The nose is flattened; the lips, very mobile, are more protruding than the Chimpanzee. The face and a great part of the fore part of the head are bare of hair, and Du Chaillu therefore proposes for this ape the name of *Troglodytes calvus*, or the bald Chimpanzee. Du Chaillu says that the Nschiego Mbouvé builds its leafy nest in the boughs of the highest trees. The nest is composed of small interlaced branches well thatched with leaves and impenetrable to water; fixed by firmly tied bands, it is generally six to eight feet across and dome-formed. The male and female join in building the nest, but they live on different trees. These retreats are seldom used for more than ten days, by which time the animal has ravaged the district around its habitation and is compelled to move elsewhere in quest of food. Du Chaillu killed a female Nschiego carrying her young one in her arms. He took the little creature home, and in a few days it was so completely tamed that he could allow it to wander at liberty without fear of it running away. He could not move a step without being followed by the youngster; neither could he sit down without having the animal climbing on his knees, or hiding its head in his bosom. The poor little thing found extreme pleasure in being caressed and nursed.

It was possessed of great intelligence, and showed wonderful cun

ning in its modes of pilfering, for "Tommy" soon acquired the art of stealing.

"If I opened my eyes," adds Du Chaillu, "while it was in the act of committing theft, it all at once assumed an honest air and came to caress me; but I could readily detect it darting furtive glances towards the bananas.

"My cabin had no door, but was closed by a mat. Nothing could be more comical than to see Tommy quietly raising a corner of this mat to see if I was asleep. Sometimes I feigned to be so, and moved just at the moment when it was carrying off the object of its covetousness, when it let it drop, and ran off in the greatest confusion."

"Tommy" did not like sleeping alone; he watched until everybody was asleep to creep furtively beside some negro friend; and there would sleep without stirring until daybreak, when he usually decamped before found out. Several times he was caught in the act and beaten, but he persevered.

II.—GENUS SIMIA.

The ORANG-OUTAN, *Simia Satyrus*, (Plate I.)—The huge man-like apes hitherto described are natives of Africa. But Asia produces animals as large and fierce as any of the Western Peninsula. The representative of the Asiatic anthropoids is the redoubtable ORANG-OUTAN. The body, in which the abdomen is very prominent, is broad at the hips, the arms are long, the neck short, with a large pouch which can be inflated. The hands and fingers are long, the lips are swollen and protruding, the nose flat, the eyes and ears small and like man's. In its terrible jaws the canines are prominent; the lower jaw is longer than the upper jaw. The hair is thin on the back and breast, but hangs long on the sides of the body; on the face it grows like a beard; on the back of the head and the fore-arm it is directed upwards, elsewhere downwards. The color of the hair is a rusty red, sometimes a brownish red, darker on the back and chest, lighter in the beard. The skin, where visible, is a bluish grey.

For our knowledge of the habits of this ape in his home, we are indebted to the intrepid Wallace. The ORANG-OUTAN, called also the Meias, appears to be confined to Borneo and Sumatra, where it dwells in low swampy woodlands. An extent of unbroken lofty forest is a

necessity for this ape. It traverses them with the utmost ease, passing from tree to tree without touching the soil. "It is a strange sight to see the MEIAS taking his way through the woods. He advances along a huge bough, in a half upright attitude; he seems to select trees which touch their neighbors. When he is near enough he puts out his long arms, seizes the branch and pulls it to test its strength; if it stands the test he swings himself into it, and thus proceeds; he never springs or leaps, and never seems to hurry, although he goes as fast as a man can run through the forest."

His long arms are seen to be of the utmost value; they enable him to climb easily, to reach the fruits on the highest, thinnest twigs, and to collect leaves and sprigs to form his nest. How he builds this nest Wallace relates. The Meias that he wounded, climbed higher up the tree and began to break off branches and lay them across. With extraordinary rapidity he seized with his still uninjured arm, boughs in every direction, and in a few minutes had formed a close mass of leafage which hid him from my view. A like nest is used for sleeping in, but it is placed nearer the ground at a height of from eight to fifteen yards. The natives say that when it rains the Meias covers his nest with leaves. The Orang-outan does not leave his nest till the dew is dry on the leaves. He feeds throughout the day exclusively on fruit, buds and young shoots; he prefers unripe to ripe fruit, and eats them when strongly bitter; he usually eats only part of each fruit plucked. It is very rarely that the Orang-outan descends to earth; he does so only when compelled to seek for water or food in the dry season. They often stand upright, but never walk in that attitude unless they have hold of a branch above them; representations of them walking by the aid of sticks are purely imaginary.

The Dayak natives affirm that no animal is strong enough to injure the Meias, and the only creature with which he fights is the crocodile, which often attempts to seize him when plucking the young shoots near the water. The Meias flies at this foe, beats him with his feet and hands, tears his jaws open and slays him. The Meias seldom fights with man.

In its native woods the Orang-outan seems to be an unsocial animal, and leads a hermit-like existence, sitting in its nest till hunger impels it to move. Like other apes it exhibits an objection to captivity, has great cunning and great docility, together with great attachment to all that

treat it kindly; a grave and melancholy expression is usually seen on its face.

Numerous living specimens have been brought to Europe. One at Paris is described by Cuvier, who gives an anecdote of its intelligence. "It was once shut up in a place in the vicinity of a saloon where it was usual for persons to assemble. After a time solitude made it impatient, and it endeavored to open the door in order to get in. But the bolt was high and beyond its reach. Ultimately it dragged a chair to the door, climbed up on it, and having drawn back the catch, triumphantly entered."

Another was brought to England by Dr. Abel Clarke; it was as docile as affectionate. It took a fancy for two kittens and patiently endured their scratches rather than lose their company. It was, however, observed trying to pull out their claws with its fingers. He adds: "Since its arrival in Great Britain, it acquired, to my knowledge, two habits which it certainly never practised on board ship, where its education, I ought to say, had been very much neglected. One of these was walking erect, or at least on its hind feet, without resting on its hands; the second was to kiss its keeper. Some writers assert that the Orang-outan gives real kisses, and they suppose that this is a natural act of the animal. I believe that they are wrong: it is acquired from imitation, and even then it does not altogether give a kiss like Man, by advancing the lips."

The Orang-outan is the very opposite in disposition to the Chimpanzee. While the latter is lively and playful, the former is quiet, solemn, and grave, his motions are slow and measured, and the expression of his brown eyes inconceivably sad.

We have mentioned above that this animal possesses a throat-pouch. This strange appendage is not a mere hollow sack, but is shaped like a badly-made glove; it is larger in the male than the female. A careful investigator, Mr. Vrolik, is of opinion that this throat-pouch has nothing to do with the voice, but is "intended to assist it in climbing and leaping." It is a pity that he did not show how it accomplishes this object. The sac is connected by a passage with the windpipe, and can be inflated at pleasure.

There seems to be in Borneo another species of SIMIA called by the natives Meias Kassar. It is much smaller than the Orang-outan, or Meias Pappan, and has often been regarded as the young of the latter.

III. GENUS HYLOBATES.

The GIBBONS.—The third genus of the man-like apes is that of the long-armed apes which are commonly called Gibbons. The scientific name HYLOBATES, or “forest walkers,” from the Greek *hyle* “a wood,” and *baino* “to walk,” was given them from the fact that they are chiefly found in the dense forests of India and the Eastern Archipelago. For life in the forest they are admirably adapted by the length of their fore-arms.

The Gibbons are divided into *Seven Species*, some of which attain a considerable size, although not exceeding three feet and a half. They are the only Anthropoid apes possessing gluteal callosities. The body, although the breast is well rounded, seems slender, owing to the thinness of the flanks; the hinder limbs are much shorter than the fore limbs, and in some species the long hand is characterized by a growing together of the index and middle finger. The head is small and egg-shaped, the face human-like, the tail is not visible externally. A silk fur covers their bodies, the colors being principally brown, brownish-gray, or straw-color.

THE HULOCK.

The HULOCK, *Hylobates hulock*, (Plate I), bears clearly the marks of the genus. It has no air-sack and the fingers do not grow together. Its hair is coal-black except a white line across the forehead; in the young it is dark-brown, and ash-gray on the back. The HULOCK inhabits Farther India and Bengal, especially the woody banks of the Brahmapootra river.

THE LAR, UNKO AND WAUWAW.

These species are natives of Malacca and Siam. The LAR, *Hylobates lar*, is almost as large as the Hulock. The prevailing color is a dark-gray, the hands are of a whitish-gray on the upper, but black on the lower surface.

The UNKO, *Hylobates rafflesii*, is distinguished from the Hulock anatomically by the possession of fourteen pairs of ribs. Its face and coat are black, inclining to reddish-brown on the back; the

eyebrows, cheeks and chin are white in the males, but dark-gray in the females.

The WAUWAU or Agile Gibbon, *Hylobates agiles*, has a bare, blue-black face, inclining in the female to brown, long hair of a dark-brown color on the head, stomach, and inside the arms; on the shoulders and behind the neck the hair becomes lighter, and in the females is light-brown, while on the hinder parts down to the knees, it is of mixed white and reddish hues. The hands and feet are dark-brown. The female is lighter colored than the male; the hair on the cheeks is shorter, but still long enough to make the face seem broader than it is long. The young are of a yellowish-white color.

Doctor Franklin, speaking of the Agile Gibbon, says: "Some years ago a female of this species was exhibited in London. The cries it emitted when going through its performances, naturalists decided to be most musical. This individual was timid and gentle. It preferred the society of women to that of men. It was thought that this circumstance was due to the bad treatment it had received at the hands of the stronger sex. It was intelligent and observant: its piercing eyes seemed to be always on the *qui vive*, scrutinizing every one, and missing nothing of what passed around. When any one gained its confidence, it consented after several invitations to descend from its perch and shake hands."

The Gibbons, as we have observed, are admirably adapted for climbing. The round chest gives room to the lungs, the strong hind legs give great propelling power, the long fore arms enable them to grasp securely the branch which is to be their next starting-point. An easy comparison will show how disproportionately long their limbs are. A man can barely touch his knee when standing erect, the GIBBONS can touch their ankles. Nothing can present a greater contrast than a Gibbon in a forest, and a Gibbon on the ground. In the former they fly like birds from bough to bough, their agility is boundless and graceful; on the ground they seem out of their element, they move slowly, they totter on their hind feet, and can only maintain their equilibrium by the aid of their long arms. If the Gorilla is the Hercules, the Gibbon is the Mercury of the ape world. The name *Lar* of one species is derived from a naiad Lara whom Mercury loved.

The HULOCK can only balance itself upright by raising its hands above its head; and then it waddles rather than walks. If urged to greater speed, it uses its long fore-arms. They hop rather than leap,

and when they use their arms they resemble cripples on crutches. The WAUWAW is the most agile. He ascends the smooth stems of the bamboo, swings the tall cane backwards and forwards till he gathers the required impetus, then flies over a space of thirteen or fourteen yards, grasps another twig, a third, a fourth, and so on, till he seems to shoot like an arrow. He is proud of his agility and is fond of displaying it when there is no occasion. A female Wauwau in London was kept in a large enclosure where trees were planted at a distance of seven or eight yards apart. All spectators were struck with wonder at its performances. It sprang from one tree to another without any preparatory efforts, and never failed in its leap. It would continue this performance for a considerable time, seeming scarcely to touch the boughs. No less remarkable was the sureness of its hand and eye. If an apple was flung at it during its flight, it caught it without a pause in its course. In the midst of its swiftest career it could in a twinkling change the direction of its flight, or come suddenly to a sitting position, in which it seemed as if it had never been in motion.

If a young one in captivity could display such astonishing feats of agility, it is needless to say that the adult Gibbon in its native forests moves like a swallow through the air.

The HULOCKS form bands of a hundred or a hundred and fifty members, and are usually seen in the tops of very high trees, occasionally descending to disport themselves in the clearings of the forest. Owen relates that in riding through the jungle he came upon a powerful band; the trees were full of them; they screamed and grimaced at the intruder, and some of the bolder spirits followed him as if with the intention to attack. Such attacks on travelers are said to be not uncommon. Owen's account, however, is at variance with all other observers, who agree in describing the Gibbon as running away from the sight of man.

At sunrise and sunset the Gibbons assemble and unite their voices in a clamor that can be heard a full mile away. This cry is very peculiar. Bennett says it begins with the fundamental note E and goes up through the chromatic scale to the E an octave higher. As it runs up the scale, the semitones come out slower and slower; as it descends, the notes increase in rapidity till the end is a yelling scream. The regularity, swiftness and precision with which these animals run up the scale is astonishing. The Wauwau derives its name from its cry. It begins

ua, ua, ua, then the a becomes longer, the u shorter, till it sounds like wa, and then the whole band join in the chorus.

The long-armed apes soon become tame. Harlan possessed a Hulock that, like the large apes already described, could sit at table, and learned to drink from a cup like a man. It preferred a vegetable diet, but sometimes ate a bit of fish or chicken. "When I paid him my morning visit, he greeted me with a loud Wau, wau, wau! repeated till he was quite out of breath. He liked to be combed and brushed, and stretched out first one arm, then another. He knew my voice and replied when I called to him from a distance."

The Gibbons are seldom found in captivity, even in their native country. They cannot bear the loss of freedom; they pine away in regret for their forest home and woodland sports, and become gradually quieter and quieter, sadder and sadder, till death sets them free.

IV.—GENUS SIAMANGA.

The SIAMANG, *Siamanga syndactyla*, differs in some considerable respects from the preceding genus, and one of the most striking of these is indicated by its name *syndactyla* (Greek *syn* "together," *dactylos* "a finger"). The fore and middle fingers of the posterior limbs are united by a membrane, and its arms are shorter than those of the other species. The low forehead presses down upon the eyebrows, the eyes are deep-set, the nose flat, the nostrils large, the mouth enormous. The air-sack, formed by loose folds of skin, consists of a double pouch at the throat; it protrudes like a bird's crop, and swells when the creature cries. A thick soft coat of deep black hair covers the body; the eyebrows, however, are of a reddish-brown. The hair of the fore arm points upwards, that of the upper arm downwards, just as in Man. The height of a full grown *Siamang* is about forty inches, but it can span twice that length. It is a native of the thick forests of Sumatra.

According to Duveaucel, the Siamangs collect in numerous troops, under the leadership of an experienced chief, and greet the sun, at its rising and setting, with cries which are heard for several miles around. They are not very nimble, but their sense of hearing is extremely acute; the moment they notice the slightest sound, they decamp without delay.

But if they are on the ground, and they have not time to reach trees, they are easily overtaken. The troop, however numerous, abandons one of their members who is wounded unless the victim be a young one; then maternal love bids the mother fly to the protection of her offspring, and with inflated air-sack and outstretched arms she faces the enemy. Otherwise, too, this maternal instinct is touchingly evinced. The mother bears her little one to the river, bathes it in spite of its cries, and carefully rubs it dry. The Malays affirm that the male parent carries the male young ones, while the mother bears the females, and travelers assert that this report is true.

One of these animals was for some time an inmate of a ship, where it became quite companionable, and gained the affections of passengers and crew. So far from exhibiting the sullen and sluggish demeanor which has been attributed to this ape, the Siamang displayed great activity and quickness, skipping about the ropes, and given to harmless tricks. It took a fancy to a little Papuan girl who was on board, and would sit with its arms round her neck, eating biscuit with her. It was of an inquisitive nature, running up the rigging, and watching from its elevated position a passing vessel, and remaining there until the ship was out of sight. In temper it was rather uncertain, and apt to fly into a passion if opposed in any wish.

When thus excited, it would fling itself down, just like a naughty, spoiled child, roll about the deck with great contortion of limbs and face, strike at everything which came in its way, and scream incessantly, with a sound like "Ra! ra! ra!"

It had a strange predilection for ink, and in order to procure this remarkable dainty, would drain the ink-bottle whenever there was an opportunity of so doing, or suck the pens in default of the liquid itself. Being itself destitute of a tail, and feeling no fear of reprisals in that direction, the Siamang used to make very free with the tails of some monkeys that lived on board of the same vessel. Catching an unfortunate monkey by its caudal appendage, away went Ungka, as the ape was named, dragging the monkey after him along the deck, until the wretched animal writhed itself free from its tormentor. At another time, Ungka would carry the monkey by the tail up the rigging, in spite of its squeaks and struggles, and then quietly let it drop.

It was sensitive to ridicule; and when its feelings were hurt, it used to inflate its throat until it resembled a huge wen, and looked seriously

at the offenders, uttering hollow barks at intervals. This sound seemed to be used for the purpose of expressing irritation. Anger was expressed by the shrieking "Ra! ra!" and pleasure by a kind of mixture between a squeak and a chirp.

Wallace had a Siamang that used to play with his native servant. Hence we may conclude that this genus does not deserve the character given it by some authors who describe it as a dull and stupid animal, that does not care to distinguish between friend and foes, that will not move till forced to do so, hardly even taking the trouble to put its food into its mouth.

Mr. Bennett the English naturalist confirms Wallace's account of the gentleness of this species. He writes: "Going into the courtyard where Ungka was tied up one morning, I was sorry to see it occupied in trying to get rid of its waist-belt and rope, while at the same time it uttered a sharp, plaintive cry. When unfastened, it went towards a group of Malays, and after catching hold of the legs of some of them, it approached one who was lying down, jumped on him, and closely embraced him with an expression of recognition. I learned that this man in whose arms the Monkey showed so much pleasure, was its first master."

Mr. Bennett adds that Ungka preferred vegetables, such as rice and onions, to flesh. She drank tea, coffee, and chocolate, but never wine or spirituous liquors.



CHAPTER V.

THE OLD WORLD MONKEYS.

THE LONG-TAILED MONKEYS—THE GENUS SEMNOPITHECUS—THE PROBOSCIS MONKEY—THE DOUC—
THE GENUS COLOBUS—THE GUEREZA.

LEAVING the anthropoid or tailless apes, we now proceed to consider the remaining apes of the Old World. The old world monkeys differ from the anthropoid apes by the shortness of their arm, the presence of tails and gluteal callosities, and, in many instances, of cheek pouches. The "gluteal callosities" are those bare and hard plates which are seen on the posterior parts of these animals, and on which they rest when sitting. The cheek pouches are sacks, more or less capacious, between the cheeks and the jaws, in which they place their food when they wish to reserve it. Like the tailless apes, the tailed monkeys of the Old World have the same "dental formula" as we ourselves possess; and their tails are not prehensile or able to lay hold of anything. As a rule they are sagacious, but mischievous and ungraceful, and very destructive. Hence some nations regard them with fear and abhorrence, others regard them as sacred or divine.

The apes described in this chapter differ, as we have said, from the anthropoid apes by the possession of a tail; they differ also from those which will be hereafter described in the length of this appendage and in the use they make of it. The tail in these genera is usually very long; it is habitually raised, and serves as a balance.

They are divided into two families, of which the first or SEMNOPITHECIDÆ are distinguished by the absence of cheek pouches.

I.—GENUS SEMNOPITHECUS.

The genus SEMNOPITHECUS (from the Greek words *semnos*, grave, and *pithecus*, ape) is found in Asia. They are slender, with long limbs,

a long tail, a small head, a hairless face, a short muzzle, and very slight callosities. *Twenty-nine Species* are known.

The hands have long fingers, but the thumb on the fore limbs is very short, and of no use for grasping. Their hair is fine, and often very long on the head. The conformation of the stomach is peculiar, and distantly resembles that of the Kangaroo. All species possess an air-sack.

They are natives of the mainland of Southern Asia and the islands of the Indian archipelago. They live in troops in the forests, usually near running water, and near villages and cultivated ground. Wallace gives a very vivid description of them in their native haunts. The traveler generally finds them in companies of twenty or thirty, busily engaged in seeking food. They seldom are seen on the ground, unless when picking up some fallen fruit. They pay no attention to the natives, but avoid Europeans. When alarmed they hide in the trees, or fly with extraordinary rapidity, springing from bough to bough. It is amusing to witness the attempts the less agile make to follow their leader; very often some of the last of the company hesitate about taking a daring leap, till the foremost are almost out of sight; then they are filled with despair at the prospect of being left, jump wildly into the air, and often fall to the ground. Their usual food consists of fruits of all sorts, buds and leaves; they seem to prefer the buds of the red Hibiscus even to bananas.

THE HULMAN.

This species, the HULMAN or Huneman of the Hindoos, *Simnopithecus entellus*, is the Sacred Ape of India. As it is carefully protected by the natives, it is very common in lower India. The tail is usually about three feet long, the body about two. The hair is of a yellowish white, the hairless parts dark violet. The face, hands and feet, as far as they are hairy, and a stiff rim of hair projecting over the eyes, are black; the short beard is yellow.

The Hulman or Huneman monkey occupies a high place among the thirty millien deities of the Hindoos, and has enjoyed this honor for countless ages. Huneman is said in their mythology to have liberated Sita, the wife of Rama, from the giant Ravan, and to have brought from the garden of the giant the luscious Mango. For the theft of the Mango he was condemned to be burnt at the stake, but Huneman extinguished the fire, burning thereby his face and hands, which have remained black

among his descendants. A ruling family of Indian princes claim to be descendants of Huneman, and proudly claim the title of "the tailed Rama." High is the honor still paid to this sacred ape. Death is the punishment of any violence offered to him; and the Hindoos allow him to rob their gardens or steal from their houses with impunity. In Benares the streets are full, the houses covered with these holy animals, and any injury provokes a tumult. Hügel relates that a fakir called some of these apes to him, and then gave them nothing to eat; three of the oldest attacked him, he drove them off with his staff; the populace at once took the side of the apes, and gave the man a good beating. Bishop Heber relates that two English officers, who shot an ape near Bindrabund, were driven into the River Jumna and drowned by a fanatic mob of Brahmins and devotees. Great commotion was excited at Kishnagur when, in compliance with a petition of the reforming party in India, the government destroyed five hundred of these larcenous deities.

Apart from their thievish propensities these apes are attractive creatures. A crowd of them will assemble, disperse with magical celerity, and in a couple of minutes reassemble. They mount with incredible speed to the tops of the trees, descend with equal swiftness, leap from tree to tree, and in a few minutes traverse the whole garden backwards and forwards without touching the ground. In youth their head is round, and they are easily tamed; but as the shape of the skull alters, their disposition alters. The skull becomes flatter, the ape more brutal; he becomes dull instead of bright, violent instead of cunning, and has scarcely anything in common with his youth.

In the forests they form numerous bands under the leadership of an old male, under whose guidance they rob and plunder the neighborhood, or undertake distant expeditions. Strange tales are told of their wanderings; they are said to visit at regular intervals of many years certain holy groves, stay there a few days, and then mysteriously return to their distant home. Wherever they appear they become an object of solicitude to the pious Hindoo. The sacred fig-tree is their favorite dwelling, and snakes their chief aversion. They are said to watch till the reptile is asleep, then seize it behind the head, and dash its brains out against a stone.

Like all the apes the Huneman is devoted to its young. Duvancel shot one that had its young in its arms. The dying mother collected all her strength, took the little one and placed it on a bough. "I could

not," he adds, "master my feeling of repentance for having killed a creature which even in death manifested the noblest and purest feelings."

THE BUDENG.

The BUDENG, *Simnopithecus maurus*, called also the Negro Monkey, furnishes the furs which were so fashionable with ladies a few years ago. His hair is glossy black, on the hands and face like satin, on the back like silk. The head is covered with a peculiar cap of hair which falls over the forehead and grows down both cheeks. The length of the Budeng is about three feet, fully one-half being tail.

The Budeng is found in Java in troops of from forty to fifty. At the approach of man they raise a loud cry and spring madly into the trees, and hurl on the intruder broken branches. But they soon lose their fear. The sacred fountain of Progo has from time immemorial been frequented by a tribe of half-tame Budengs, never exceeding fifteen in number, which come down from the trees on the approach of visitors, and surround them with an air of confident familiarity. At Amsterdam there were two Budengs which usually sat curled up together side by side, the hands crossed over the breast. Their grave appearance was enhanced by the thick mass of hair falling over the face. They came slowly to receive their food, but took it quietly and thoughtfully; their expression was sagacious, but not lively. They were terribly annoyed by two monkeys of the genus *Cynocephalus*. These latter delighted in teasing the solemn Budengs, who at the sight of their tormentors embraced each other closely. The foes seemed to take a malicious pleasure in loosening this close embrace; they jumped on the Budengs, rode on their backs, pulled their tails and hair, and climbed over them as if they had been part of a tree; their cruel sport became more cruel when their hapless victims screamed out. A Budeng at Antwerp showed a similar timidity in the presence of the little *Macacus*, which kicked and cuffed him at its pleasure.

THE KAHAU.

The PROBOSCIS MONKEY, or Kahau, *Simnopithecus nasica*, (Plate II), is so called from his nose. This organ hangs down over the upper lip, and is a caricature of the human feature; it has the peculiarity of being very movable. The Kahau has callosities, and the tail is

long. Its color presents a curious variety of hues. The hairs on the skull are short and thick, on the back of the head and on the sides of the face they are longer, and form a kind of collar round the neck. On these parts they are of a bright brownish red, on the back a brownish yellow, on the breast a light reddish yellow, on the extremities and tail, ash-gray. The Proboscis Monkeys live in Borneo, where, morning and evening, they assemble on the river banks, uttering howls which resemble in sound the word Kahau; they leap and climb with great agility. They are said to be difficult to tame, mischievous and savage, defending themselves fiercely when attacked. The natives of Borneo affirm that when they leap they keep one of their hands before the nose, to save that prominent feature from injury. This of course is a mere fancy, but argues a belief in the animal's sagacity. The natives furthermore believe that the Kahau is a man who has taken to the woods to avoid paying his taxes, and consequently they admire and envy him.

THE DOUC.

This monkey, *Sennopithecus nemus*, is distinguished by the bright tints of his coat. The back, flanks, top of the head, and arms are gray, speckled with black; the thighs and the digits are black; the legs and tarsi a bright red; the fore-arms, the lower parts of the legs, the buttocks, and the tail are a pure white; and the throat is white, encircled with a ring of bright red, and the face is adorned with white whiskers. It is a native of Cochin China, and attains the height of four feet, but we know little of its habits in its state of freedom.

II.—GENUS COLOBUS.

The Colobus is an African representative of the *Sennopithecus*, and it obtains its name Colobus, or "maimed," from the fact that it possesses only four fingers on the fore-arms. The body is slender, the muzzle short, the tail very long; and the species has no cheek pouches. Many of them are remarkable for the color and growth of their hair.

THE GUEREZA.

The GUEREZA, *Colobus guereza*, is, in the judgment of some observers, the most beautiful of all the monkeys. It is a native of Abyssinia, and presumably of other regions of Central Africa. On the body

the hair is like satin, and deep black in color; but a band across the forehead, the temples, the side of the neck, the chin, throat, a mane-like girdle extending from the shoulders across the loins, and the bushy tip of its tail, are white. Each hair is ringed with slender brown bands, is very soft and fine and of considerable length. The mane, if mane it can be called, running down both sides of the body, hangs like a silver mantle, and is an ornament of indescribable beauty, as the jet-black hair of the body is seen darkly gleaming through its silvery fringe, which is very long over the back of thighs. The length of the body is about two feet, that of the tail without the tuft a little longer.

The Guereza is found everywhere in Abyssinia south of North Latitude 13°, in a chain of highlands six to seven thousand feet above the sea level. It lives in bands of from ten to fifteen in lofty trees near the clear-flowing mountain-streams, and loves the neighborhood of the churches, which usually stand under the shadow of consecrated trees. The Juniper (*Juniperus procera*) which grows there to a height that dwarfs our pines or hemlocks, is a favorite abode. The Guereza is very agile, and, till he has experienced the violence of man, anything but shy; he creeps like a cat towards the disturber of his peace. When in flight he presents a spectacle of grace and beauty as he leaps from bough to bough, with his white mantle floating around him like the white burnous of an Arab chief over his charger. In contradistinction to other apes he is regarded by the natives as harmless, for he seldom injures the crops. The skin is much prized as an ornament of the shields of the native warriors; a skin is said to be worth six fat sheep.

Two species, *Colobus ursinus* and the *Colobus satanas*, need little mention. The former has a white tail, but the rest of the body is covered with hair of a dirty yellow mixed with black. The latter is entirely black, and is perhaps only a variety. Both these species are found in Western Africa.



CHAPTER VI.

BABOONS AND MACAQUES.

THE FAMILY CYNOPITHECIDÆ—THE GENUS MYIOPITHECUS OR TALAPOIN—THE GENUS CERCO-
PITHECUS—THE GUENONS—THE GENUS CERCOCEBUS OR MANGABEYS—THE GENUS MERO-
PITHECUS OR GELADA—THE GENUS CYNOCEPHALUS OR BABOON—THE BABOON PROPER—THE
CHACMA—ITS USE IN FINDING WATER—THE SPHINX—THE HAMADRYAD—ITS PUGNACIOUS
DISPOSITION—DISGUSTING CHARACTER OF THE MANDRILL AND DRILL.

THE family of CYNOPITHECIDÆ comprehends all the monkeys with cheek pouches, and the baboons. The scientific name signifies "dog-apes," but only some of them, the *Cynocephali*, have much resemblance to our domestic favorite. The genera of this family amount to *Seven*, which will be treated in this and the succeeding chapter.

I.—GENUS MYIOPITHECUS.

This genus differs from the following genera by the development of the brain, the shortness of the muzzle, and the structure of one of the molar teeth. In the large ears and short face with an internasal septum it somewhat resembles the American monkey. There is only *one* species.

The TALAPOIN, *Myiopithecus talapoin*, is the smallest of the Old World monkeys; the fur is of a greenish hue, forming on the forehead a sort of tuft; the face is flesh-colored, the nose black, the whiskers yellowish. It is a very gentle creature, and exhibits in captivity intelligence and liveliness. It is a native of West Africa.

II.—GENUS CERCOPIITHECUS.

To this genus belong many of the monkeys seen in zoological gardens or menageries, here and in Europe. Their generic characteris-

ties are a slender form and limbs, a depressed cranium, delicate short hands with long thumbs, a long tuftless tail, large cheek pouches, and large gluteal callosities. These are generally vivid, in some species very varied. About *twenty-four* species are known, all natives of the tropical regions of Africa. They all choose for their abode woods near rivers; by preference in the vicinity of cultivated land. It is worthy of remark that this genus of monkey and parrots correspond not merely in form and manner of life, but in geographical distribution. Wherever in Africa these apes are found, parrots may be looked for; wherever there are parrots there *Cercopithecæ* are found. Between the two continual war is waged, the cause of strife being the tail feathers of the parrot.

The motives that incite the monkeys to pluck out these feathery trophies are twofold, each of them dear to the very soul of the mischievous creature. The first and most obvious motive is that of sheer mischief, but the second is of rather a more complex character. When an immature feather is recently drawn from a bird, its quill portion is generally soft, and filled with the material by which the feather is supplied with nourishment. The monkeys take great delight in sucking these soft feathers; and in order to procure a supply of this curious dainty, chase the poor parrots, even to the tops of the trees. At first sight, it would appear that the legs and arms of the monkey would have little chance of winning a prize defended by the beak and wings of the parrots, which sit exultantly screaming on twigs that bear their weight easily enough, but are too slender even for the monkeys to venture upon. But the restless vigilance and quick hand of the monkey often win the day; and while the parrot is shrieking defiance to an enemy in front, it is suddenly startled from its fancied security by the loss of its tail, which has been snatched away by a stealthy foe from behind. The deafening din which is occasioned by the joint voices of parrots and monkeys, may be easier imagined than described.

They are the most social and active of all apes. They live in large bands; they form a state of their own, and acknowledge no chief but the strongest of their fellows; they make themselves at home everywhere, and seem to pass their lives without fear of hunger, and in continual cheerfulness. Infinite frivolity and a ridiculous seriousness unite in all their actions. No object is too remote, no tree-top too high, no treasure secure enough, no property respected, when these apes appear. The traveler hears the calls of the ape leader, and soon his ears detect the

rush of the band through the leafy forest; he then sees them running, clambering, playing, cleaning themselves, fighting; they never try to conceal themselves. A foray of these apes is a remarkable sight to an uninterested spectator. Under the lead of an experienced patriarch they make their approach to the cornfields; the females carry their young, who cling to their breasts, and at the same time take a turn with their tail round the tail of their mother. At first they are cautious. The patriarch goes first; the others follow step by step, and mount not only the same tree but the same branch as he does.

The leader sometimes climbs to the very topmost spray to get a good view of the neighborhood; if the prospect is favorable, a low gurgling note tells the good tidings to his subjects; if unfavorable, he utters a cry of warning. They alight from a tree near the field, and then with vigorous leaps advance into their paradise. Then their activity is prodigious. Heads of corn, ears of millet are plucked, the grains picked out and placed in their cheek pouches; when these capacious receptacles are full, the band relaxes a little from its labors and becomes more fastidious in what it steals. They carefully smell the ears they pick, and if the odor is not satisfactory, reject them; of ten heads of corn only one is really eaten. As a rule they take merely a couple of grains from each head and then the rest is flung away; they are fond of eggs and partial to honey.

When the troop thinks itself in perfect security in the cornfield, the mothers put down their little ones to play, but keep a sharp eye on them. All are careless except the leader. He, even in the daintiest repast, stops, stands erect, and looks around at short intervals. After each observation he utters his note of safety if nothing displeasing is seen, or an indescribable quavering note of warning if an enemy is in sight. When this last tone is heard, the band at once reassembles, the mothers call back their children, all are ready for flight, and hurriedly grasp as much food as they can carry off. If the danger presses they gradually unload, but do not part with the last of their burden till both hands and feet are necessary. Wide intervals from tree to tree, dense hedges, prickly thorns, are all unable to check their march. Their leaps are astonishing; in mid-flight they can change their direction by means of their long rudder of a tail; they leap from a tree-top to the earth, fly over the ditches and with lightning-like speed up another tree. Their leader conducts them through all their operations with his voice, now bid-

ding them to increase, now to diminish their speed. With all this bustle there is no symptom of alarm or cowardice, but a constant display of perfect presence of mind. Danger does not exist for them till man appears.

When the leader has satisfied himself by examination that his troop are once more in a safe spot, he utters his note of security. Then again his followers are busy; this time with ridding each other of thorns or splinters which have run into them during their flight. A monkey lays himself out at full length on a bough, another examines him carefully and thoroughly, every tangle is loosened, every thorn extracted, any vermin hunted out and eaten. These surgical performances over, the troop returns without delay to the field whence it has just been driven. Thus the natives can never leave their crops unwatched. No means are left untried to keep off their terrible enemies, but human resources and even charms or amulets are all in vain. "The apes," said a venerable Sheik of the Soudan, "are godless and respect not the words of the apostle of God. Other creatures of the Lord respect his prophet, the apes scorn him. If you hang an amulet in your field, the elephant will not touch it. He is a just creature; the ape is a being changed by God's wrath from a man into a horror; a son, grandson, great-grandson of the evil one."

The natives take them in nets; and it is easy to shoot them for one who has the heart. Brehm writes: "I shot one straight in the face; it fell from the tree, then sat up and without a cry or groan wiped away the blood trickling from its wounds in such a human fashion and with such noble, calm resignation, that I hastened to end its misery with my hunting-knife. From that day forward I have never shot an ape; the image of the dying creature haunts me; I felt as if I had murdered a man."

These apes are too active for most beasts of prey; the leopard alone at times catches some unwary youngster. Birds of prey they repel by combined action. A hooded eagle (*Spizactes occipitalis*) was seen to seize a young monkey. The little one held on to the branch with legs and arms, screaming. At once there was an uproar; the eagle was surrounded by ten big fellows who attacked with angry visages and fearful yells. The eagle soon dropped his prey, to struggle for his own safety; the tail feathers and back feathers that began to fly were proofs that he found some difficulty in escaping. Birds' nests the monkeys rob without mercy; but in searching for nests in hollow trees they display great

circumspection, lest a snake be in it; for snakes are an abomination to them. As to moral qualities, no two are alike; some are quarrelsome, some quiet, some morose, some sly, some cheerful, others malicious— all, however, love to guard, tend and cherish smaller animals.

THE GUENONS.

The GREEN APE, *Cercopithecus sabaeus*, (Plate II), attains a length of about forty inches, fully one-half being tail. The hair on the back is grayish-green, ringed and tipped with black; that of the arms, legs and tail ash-gray, the short whiskers whitish; the nose and eyebrows are black, the face light-brown.

Another species called DIANA or Bearded monkey, *Cercopithecus diana*, is a small slender animal, conspicuous by its long beard on cheek and chin, and a white crescent on its brow. The color is mainly gray, the back a purplish brown, the beard and under side of the body white. The species called the Nun, *Cercopithecus mona*, resembles the apes just described with the exception of wanting the pointed beard. From this name *Mona* it is probable that our word "Monkey" is derived.

THE WHITE-NOSE AND THE RED APES.

The WHITE-NOSED MONKEY, *Cercopithecus petaurista*, is an inhabitant of Western Africa. It is a curious little creature, with an air of quaint conceit, for which it is indebted to the fringe of white hairs that surrounds its face, and the conspicuous white spot on the nose, which has earned for it the title of White-nose. As is so often the case in these animals, the under-side of the body and inside of the limbs is of a much lighter tint than the upper portions. This distinction is peculiarly well marked in the long tail, which is nearly black above, and beneath takes a grayish hue.

The RED APE, *Cercopithecus ruber*.—This species, commonly called the Hussar, is by no means so amiable as those we have just mentioned. It is nearly one-half as large again as the other species, the face is black, the nose whitish, the cheek whiskers white, the head is marked with a dark-red spot; the rest of the body is of a shining golden red color on the upper surface, but white on the inside of the limbs.

The Hussar ape extends from the West Coast of Africa to Abyssinia, but is much rarer than the Green apes. It is found in low thickets or tall grass, with which the color of its coat harmonizes. In character it is the very opposite of the Green apes. Its countenance is morose and unfriendly, and its actions do not belie its looks. Especially as it grows older, does its temper become more irritable; it never enters into friendly relations with other animals, not even with other apes; everything seems to annoy and provoke it; a look excites anger; laughter arouses rage and fury. Then it displays its immense teeth, and, if opportunity serves, makes use of them on the observer. Kindness is thrown away, severity makes the creature worse. An adult Hussar ape has never been seen tame.

III.—GENUS CERCOCEBUS.

This genus forms the transition between the *Cercopithecus* and the *Macacus*, and the name of MANGABEY is usually given to the animals embraced in it. They are almost the same size, and have nearly the same gait as the Guenons; but they are not so nimble. Their tail is long, and they usually carry it raised above their backs. Their habits differ but little from those of the majority of the *Macacus*, and they scarcely offer anything more distinctive in their character. All that can be positively asserted is that they are more gentle and familiar.

THE MANGABEYS.

The MOOR APE or Common Mangabey, *Cercocetus fuliginosus*, is the best known representative of this genus. It attains a considerable size, a little over four feet, including two feet of tail. The color on the back is a dull black, on the stomach and the inside of the limbs a dirty gray. The face and hands are black, and a peculiar look is given by the contrast of the upper eyelids, which are pure white.

The species *Cercocetus collaris* differs from the above by having the top of the head of a dark chestnut hue, the cheeks snow-white, the rest of the body a dull black. Both species come from the West Coast of Africa.

Among the peculiar habits which distinguish the Mangabeys, we may

especially notice the action of their lips, and the mode in which they carry the tail. They have a strange way of writhing their faces into a kind of quaint grin, in which they raise the lips, and exhibit the teeth almost as if they were laughing. When walking, they have a fashion of turning their tails over their backs, and carrying them reversed, in a line almost parallel with the direction of the spine.

Few monkeys can assume more *outré* attitudes than the Mangabeys, which seem to be, among monkeys, almost the analogues of the acrobats among mankind, and twist themselves into such strange contortions, that they seem to be able to dispense with the bones and joints with which other animals are furnished. They seem to be quite aware of their own accomplishments, and soon learn that their display will bring in a supply of nuts, cakes, and fruit to their exchequer. So they keep a vigilant eye on their visitors, and when they conceive that they have drawn attention to themselves, they execute a series of agile gambols, in the hope of meeting the reward which sweetens labor.

The apes which we are now about to give an account of, are distinguished from those already mentioned by possessing short tails, which instead of being raised and carried over the back are usually pendent, and do not assist in the movements of the animal.

The name MAKARQUE or MACACO is given on the west coast of Africa to all sorts of apes; scientifically it is restricted to a numerous group of apes, distributed between Africa and Southeastern Asia, which forms Genus VI., in the following chapter.

IV.—GENUS THEROPITHECUS.

The GELADA, *Cynocephalus gelada*.—This genus is distinguished by receding nostrils, a bare spot on the neck and breast, a rich mantle, and a long tuft to the tail. It is a giant, and attains the height of a man. Its rich fur is dark-brown on the back of the head and back; the mantle and tail-tuft are yellowish-brown; the breast is a brownish-black; the face is black. The two bare spots on the neck and chest are triangular, the points turned to each other. The callosities are small and dark-gray.

A variety of this ape, called the *Tokur Sinjero*, is found in the same

regions of Abyssinia from which the Gelada comes. It differs in some slight respects from the latter, and is found only in bands of thirty or forty, while the Gelada lives in enormous companies, two hundred being only a very small troop. The Gelada sometimes comes down from the lofty mountain ranges, ten thousand feet above the sea-level, to seek his food in the low country. He then comes into contact with the Hamadryad and a regular battle takes place, both parties using stones. They usually go on all-fours, but sometimes erect themselves, using the tail as a support. They never climb high trees.

V.—GENUS CYNOCEPHALUS.

We now approach a class of apes, very remarkable but exceedingly disgusting, both in their appearance and their habits. They are the most repulsive and degraded variety of the *Quadrumana*; all grace of motion or form has vanished, all nobler qualities sunk into abominable and loathsome lasciviousness.

They derive their name of *CYNOCEPHALI*, or Dog-heads, from the position of the nostrils at the extremity of the muzzle, and the formation of the head and jaws. Unfortunately they do not possess the amiability and intelligence of the dog as well as the shape of his head. Next to the anthropoid apes, they are the largest members of the order. Their frames are square, their muscular force immense. The limbs are short and thick; the gluteal callosities attain a repulsive size and are of an intensely bright color.

They are distributed through Africa and parts of Asia, but the former continent seems their native home. They live in rocks, and avoid trees, which they only climb when compelled to do so. Their food consists of roots and fruits that grow on the ground, insects, birds' eggs, snails, and the like. They do great damage to plantations and vineyards, and carry off the fruit to some inaccessible spot where they store it up for future use. They are said, in plundering a garden, to form a chain and pass the spoil from hand to hand. This is perhaps an exaggeration, but it is certain that they appoint sentinels to give warning of the approach of man; and these sentinels, if neglectful of their duty, are flogged to death by their comrades.

The distinguishing title of this genus is formed from two Greek



GREEN MONKEY SPIDER MONKEY SAPAJOU PROSCIS MONKEY BABOON MACACUS

PLATE II OUADPRUMANA

words, *kyon*, *kynos*, "a dog," and *kephale*, "a head." They are large-sized animals, ungainly in shape, and possessed of great vigor. These various advantages, joined to their naturally brutal and ferocious disposition, make them dangerous to man, especially when full-grown. They have the supra-orbital arch largely developed, deep cheek pouches, and all the limbs nearly of the same length. Their hands are well formed, and all four provided with an opposable thumb. In general the coat is long and woolly, principally on the upper parts of the body. The callosities, as well as their face, are often tinted with the most brilliant colors. Their senses are highly developed; that of smell is particularly delicate.

As they approach maturity of existence, their primitive qualities, their relative gentleness and intelligence, are changed into savageness and brutality. In all their desires they then evince an incredible degree of violence and impetuosity, manifesting their appetites by the most revolting acts and gestures. At this period of their life, they are really formidable; for their upper canine teeth become transformed into long sharp tusks, which they use with such adroitness as to produce with them serious wounds. The dread they inspire in the countries they inhabit is such, that the natives will often permit their gardens to be ravaged by them in preference to running the danger of a conflict.

The *Cynocephalus* Monkeys almost exclusively inhabit Africa, a single species only being found in Asia. They live either in forests or low mountainous rocky localities, and subsist on fruits and insects. In captivity they are almost omnivorous.

The *Cynocephali* are sometimes found in innumerable bands in Senegal. A traveler in that country writes: "We found every landing-place literally covered with monkeys, in parts crowded one against another; and as we passed, they saluted us with incredible gambols and furious barkings. In stating that this meeting-place did not contain less than six thousand *Cynocephali*, I believe I am not exaggerating."

The *Cynocephali* proper are distinguished from the Mormon or Mandrill by the length of their tails.

There is a wild Arab legend told about them which is given in the *Herat el Heiwan*, or "Life of Animals," by Kemaleddeen Demiri. "Once on a time there stood on the banks of the Red Sea a city, the name whereof was Aila. Its people were Jews. But these Jews violated the sabbath regularly by catching fish on that day. Pious men remonstrated

in vain, and when their words were unheeded, veiled their faces and left the godless town. Three days afterward they returned. They found the gates shut, but clambered over the walls, when they found themselves surrounded by baboons, some of which came to them with sad looks, and fawned upon them with a piteous and imploring expression of countenance. The returned natives thought that these baboons, which seemed to recognize them, might be some of their kinsfolk; and when they asked, 'Baboon, tell me, are you Abraham, my brother's son, or my cousin Moses or Achmed?' the creatures sadly nodded an affirmative reply."

The first species, *Cynocephalus babuin*, (Plate II) possesses the name of BABOON *par excellence*, and presents characteristics that are typical of the entire race. There is great uncertainty about the precise differences between the several species, as travelers too often use the term Baboon to designate not only this species, but also the CHACMA and the SPHINX. All of them have very similar modes of action and habits: The baboon has smooth, even, short hair, of an olive-green, each hair tinged alternately with black and yellow, lighter in color on the belly, and a whitish-yellow on the cheeks. The face and ears are bluish-gray, the upper eyelids whitish, the hands gray, the eyes light-brown. They grow to the height of two feet, or two and a half measured from the shoulder to the ground, and a total length, including one-third tail, of nearly five feet.

The baboon abounds in Africa, and annoys the natives, especially the women, who go to get water. In their rocky fastnesses their chief foe is the leopard, of whom they are in great dread. Yet this animal never attacks either a band of baboons or even an adult, but confines its exertions to slyly stealing the young ones.

Bold as are these monkeys, they will not dare to follow a leopard into its den; so that, if their dreaded foe succeeds in once getting clear of their outposts, it may carry off its prey with impunity. The constant dread which the leopard seems to excite in a baboon's mind appears to be occasioned by the stealthy craft and the persevering aggression of the animal, rather than by its physical powers alone. He is easily tamed, and becomes accustomed to man and most devoted to his master, soon recognizing any name given to him. He readily drinks wine or brandy, but rejects spirituous liquors.

A very quaint story is told of the same animal, which, if true, exhibits the strangest combination of cunning, simplicity, and ready wit, that

ever entered the brain of living creature. At all events, if it be not true, it deserves to be so.

It appears that the baboon was so tame, and had proved so apt a pupil, that its master had taught it to watch the pot in which he prepared his dinner, and was accustomed to leave it in charge of the culinary department while he was engaged in other business. One day, he had prepared a fowl for his dinner, and after putting it into the pot and the pot on the fire, went away for a time, leaving the baboon in charge, as usual.

For a time all went well, and the animal kept a quiet watch over the fire. After a while, it was seized with a desire to see what might be in the pot, and so, taking off the lid, peeped in. The odor that issued from the boiled fowl was gratifying to the animal's nostrils, and induced it, after a brief mental struggle, to pick just a little bit from the fowl, and to put the bird back again. This was done accordingly, but the experiment was so very successful that it was speedily repeated. Again and again was a morsel pinched from the fowl, until the natural consummation followed—the fowl was picked quite clean, and nothing left but the bones.

Now came remorse and sudden fear, causing the wretched animal to chatter with terror at the thought of the scarifying which was sure to follow so grievous an offence.

What was the poor thing to do? Time was passing, and the master must soon return for his dinner. At last a brilliant thought flashed through the animal's brain, and it immediately acted upon the idea.

Now, in order to understand the depth of the craft which was employed, it must be remembered that the baboons are furnished, in common with very many monkeys, with two callosities on the hinder quarters, which serve them for seats, and which are, in these animals, of a bright red color.

Rolling itself over and over in the dust, it covered its body with an uniformly sombre coating, and then, gathering itself well together, and putting its head and knees on the ground, it presented an appearance marvellously resembling a rough block of stone with two pieces of raw meat laid on its top. In those climates the birds of prey absolutely swarm, and, being encouraged by their well-earned impunity, crowd round every place where cooking is going on, and where they may have a chance of securing a portion, either by lawful gift, or lawless rapine.

Several of these birds, among which were some kites, being attracted by the scent of the boiling meat, came to the spot, and seeing, as they thought, some nice raw meat temptingly laid out for them, swept upon their fancied prize.

In a moment the baboon had sprung to its feet, and, with a rapid clutch, seized one of the kites. The cover was again taken off the pot, and the shrieking and struggling prisoner thrust into the boiling water in spite of its beak and claws. The lid was then replaced, and the baboon resumed its position of attention as if it had committed no offence.

THE CHACMA.

The CHACMA, *Cynocephalus porcarius*, sometimes called the Ursine Baboon, but more commonly the Chacma, is a native of South Africa. It is considerably bigger than the common baboon, and is more powerfully built, while its color is darker. It is most frequently met with on Table Mountain, in the neighborhood of Capetown, and on the Draakenberg range. Troops of from twenty to thirty individuals frequent the ravines and often enter cultivated grounds, where they commit the greatest ravages.

It is an accomplished robber, and baffles alike dogs and men. When young it is docile, and it can be taught to find roots or water, to blow the fire of a forge, or drive a pair of oxen. It possesses so acute a power of smell that it is almost impossible to destroy it by poison.

When the water begins to run short, and the known fountains have failed, as is too often the sad hap of these desert wells, fortunate is the man who owns a tame Chacma, or "Bavian," as it is called. The animal is first deprived of water for a whole day, until it is furious with thirst, which is increased by giving it salt provisions, or putting salt into its mouth. This apparent cruelty is, however, an act of true mercy, as on the Chacma may depend the existence of itself and the whole party.

A long rope is now tied to the baboon's collar, and it is suffered to run about wherever it chooses, the rope being merely used as a means to prevent the animal from getting out of sight. The baboon now assumes the leadership of the band, and becomes the most important personage of the party.

First it runs forward a little, then stops; get on its hind feet, and

niffs up the air, especially taking notice of the wind and its direction. It will then, perhaps, change the direction of its course; and after running for some distance take another observation. Presently it will spy out a blade of grass, or similar object, pluck it up, turn it on all sides, smell it, and then go forward again. And thus the animal proceeds until it leads the party to water; guided by some mysterious instinct which appears to be totally independent of reasoning, and which loses its powers in proportion as reason gains dominion.

Captain Drayson, an English artillery officer, gives some interesting accounts of the Chacma.

“During the shooting trip with the Boers, I awoke before daybreak, and as I felt very cold and not inclined to sleep, I got up, and taking my gun, walked to a little ravine, out of which a clear, murmuring stream flashed in the moonlight, and ran close past our outspan. A little distance up this kloof, the fog was dense and thick; the blue and pink streaks of the morning light were beginning to illuminate the peaks of the Draakensberg, but all immediately around us still acknowledged the supremacy of the pale moonlight. I wanted to see the sun rise in this lonely region, and watch the changing effects which its arrival would produce on the mountains and plains around.

“Suddenly I heard a hoarse cough, and on turning, saw indistinctly in the fog a queer little old man standing near, and looking at me. I instinctively cocked my gun, as the idea of bushmen and poisoned arrows flashed across my mind. The old man instantly dropped on his hands; giving another hoarse cough, that evidently told a tale of consumptive lungs; he snatched up something beside him, which seemed to leap on his shoulders, and then he scampered off up the ravine on all-fours. Before half this performance was completed, I saw that the little old man was an Ursine baboon with an infant ditto.

“A large party of the old gentleman's family were sitting up the ravine, and were evidently holding a debate as to the cause of my intrusion. I watched them through my glass, and was much amused at their grotesque and almost human movements. Some of the old ladies had their olive branches in their laps, and appeared to be ‘doing their hair,’ while a patriarchal old fellow paced backwards and forwards with a fussy sort of look; he was evidently on sentry, and seemed to think himself of no small importance.

“This estimate of his dignity did not appear to be universally ac-

knowledge; as two or three young baboons sat close behind him watching his proceedings; sometimes with the most grotesque movements and expressions they would stand directly in his path, and hobble away only at the last moment. One daring youngster followed close on the heels of the patriarch during the whole length of his beat, and gave a sharp tug at his tail as he was about to turn. The old fellow seemed to treat it with the greatest indifference, scarcely turning round at the insult. Master Impudence was about repeating the performance, when the pater, showing that he was not such a fool as he looked, suddenly sprang round, and catching the young one before he could escape, gave him two or three such cuffs that I could hear the screams that resulted therefrom. The venerable gentleman then chucked the delinquent over his shoulder, and continued his promenade with the greatest coolness; this old baboon was evidently acquainted with the practical details of Solomon's proverb.

"A crowd gathered round the naughty child, who child-like, seeing commiseration, shrieked all the louder. I even fancied I could see the angry glances of the mamma, as she took her dear little pet in her arms and removed it from a repetition of such brutal treatment."

THE SPHINX.

The species, *Cynocephalus sphinx*, is less brutal-looking than the Chacma. It is smaller even than the baboon proper, but more powerfully built, its muzzle is shorter, and it is remarkable for a peculiar thickening on the cheek bones. Its hair is dark-gray and reddish-brown, or chestnut; the paws are darker than the rest of the body. In the prime of existence its colors are the lightest, but as years begin to lay their burden on the animal, the hairs begin to be flecked with a slight grizzle, and, in process of time, the snows of age descend liberally, and whiten the whole fur with hoary hairs.

THE HAMADRYAD.

The HAMADRYAD, *Cynocephalus hamadryas*.—This baboon is remarkable for its form, its intelligence and its unamiable qualities; and from the peculiar length of its hair it has attained the name of Mantle Baboon. Like the common baboon it is frequently represented on the ancient monuments of Egypt, and was regarded as a symbol of the moon. Many

little images of the Hamadryad are to be seen in collections of Egyptian antiquities. The moon was supposed to have a powerful effect on this ape, which was said to hide itself and refuse all food during the dark phase of the moon. It is not now an inhabitant of Egypt, and perhaps even in the days of the Pharaohs was imported.

The Hamadryad inhabits the mountain ranges of Abyssinia and South Nubia as far north as the rains extend; water is a necessity for it. The troops at times descend into the foot-hills on the coast, but the bulk remains in the loftier mountains. Here each band occupies a territory of about two miles in diameter. Sometimes herds of fifteen to twenty are seen, but usually they reach the number of one hundred and fifty. Of these there will be ten to fifteen full grown males—monsters of great size with jaws that surpass in strength and length of teeth the jaws of the leopard—and about twice as many adult females. The face is a dull flesh-color, the gluteal callosities fiery red. The hair has the color of dry grass more than anything else. The old males have the mantle very long; a specimen, shot by Brehm, had hair measuring ten inches in length. This long hair is parted in the middle of the head, rises in bold sweeps to each side and stands out at right angles to the face, an arrangement which seems to have been adopted by many negro tribes. The tail is long, and ends in a tuft. Their dwelling-place is some inaccessible rock where caverns or holes afford good shelter, but they make considerable excursions in search of food. When undisturbed they keep silence; the approach of man provokes a cry of attention like the baying of a hound. If the approaching intruder seems dangerous, another cry is raised, more like the grunting of a herd of swine, through which the bellowing of a bull is heard. All the males fit for battle advance to the edge of the cliff and look to see what is coming. They have no fear of the natives, but are suspicious of white men.

Brehm relates: "When the troop first caught sight of us, a repeated monotonous bellow was heard; the old ones turned their heads toward us, but the young ones still played about. Our dogs, however, replied to the bellow by giving tongue, and the apes took flight. To our astonishment we discovered them again at the next turn of the valley, clinging in some inconceivable fashion to a wall of perpendicular rock. We fired at them; a terrible uproar, bellowing, howling, roaring and screaming ensued, and the whole troop ascended the cliff as easily as if they had been on level ground. The dogs came upon them as they were

crossing the valley ; as they ran up, the old males came down to meet them with grinning jaws, threatening claws, and flashing eyes. The dogs, courageous animals, accustomed to chase the hyena and to fight the wolf, were too glad to fly back to their masters. One young ape, half a year old, was cut off from his family ; the dogs had cornered him we were flattering ourselves that he would be caught. But a tall, powerful male appeared ; he advanced without noticing us or betraying any haste, proudly and with dignity walked straight up to the dogs, gave them a look of which they understood the meaning, and slowly reached the little one, which he carried off right past the dogs, who were glad enough to let him and his *protege* escape." On another occasion, the same traveler and the Duke of Saxe-Coburg and his party had a battle with these baboons. The aggressors had to change their position, as the apes hurled stones at them with dangerous accuracy. One old male was seen to climb a tree with a big stone in his hand, to get a better shot at the Germans. The valley was impassable during the fight, as the stones hurled down were larger than a man's head. They will attack without hesitation opponents not armed with muskets, as Rüppell affirms.

THE MANDRILL AND DRILL.

These animals are perhaps the most disgusting creatures of the whole animal world. They are distinguished physically from the other species of this genus by a very short tail, and both belong to Western Africa.

The MANDRILL, *Cynocephalus maimon*, is remarkable for the deep anakles, brilliantly colored, on each side of the nose. The surfaces of two unprepossessing projections are deeply grooved, and are of a deep blue tint, through which lines of scarlet and deep purple run. The end of the nose is fiery red. The gluteal callosities are of a vivid scarlet and blue, and are displayed conspicuously by the exact manner in which the beast carries his apology for a tail. The chin is decorated with a small yellow beard ; the muzzle resembles a hog's snout. Only the male mandrill possesses these hideous additions to his face. What is more remarkable is that these diverse colorations are not permanent, but disappear after or even during disease. They seem to result from a particular vascular injection, which acquires its maximum of energy when the animal is under the influence of violent feelings.

The Mandrill, when old, is vindictive and malicious. Even when

taken young, and supposed to be tame, it should never be trusted, more especially in the vicinity of females. Captivity does not tone down in any way the violence of its character.

In its native country the Mandrill is hated and feared, and, unless in large numbers and well armed, the negroes hesitate about attacking them. Like other baboons, they assault human females, and even in captivity the male baboons always make a great distinction between their visitors of either sex. Sometimes they are so jealous in their disposition that they throw themselves into a transport of rage if any attentions be paid to a lady within their sight.

This curious propensity was once made the means of recapturing a large baboon that had escaped from its cage in the Jardin des Plantes, in Paris.

It had already baffled many attempts to entice it to its home, and when force was tried, repelled the assailants, severely wounding several of the keepers. At last a ready-witted keeper hit upon a plan which proved eminently successful.

There was a little window at the back of the cage, and when the keeper saw the baboon in front of the open door, he brought a young lady to the window and pretended to kiss her. The sight of this proceeding was too much for the jealous feeling of the baboon, which flew into the cage for the purpose of exterminating the offending keeper. Another keeper was stationed in ambush near the cage, and the moment the infuriated animal entered the den, he shut and fastened the door.

Cuvier observes of a Mandrill that he studied: "It recognized certain women in a crowd, and called them by voice and gesture, and there can be no doubt that, if it had been at liberty, it would have done them harm."

Among these animals, there are some which preserve their docility for a long time. We have an instance of this in the one which was exhibited some time ago in London, and which in consequence of its intelligence acquired considerable reputation. This monkey, named Happy Jerry, seated himself with an air of hauteur in a carriage, drank porter out of a pewter-pot, and smoked a pipe with all becoming gravity.

The DRILL, *Mormon leucophæus*, is smaller than the Mandrill, his hair olive-brown, the whiskers dirty-white, the face black, the hands and feet copper-colored, the callosities bright red. It was once thought to

be a young Mandrill, but its right to be a distinct species has been satisfactorily proved.

Of both these species we may truly say with Wood: "So odiously disgusting are the habits in which these animals continually indulge, that, as a general rule, their presence is offensive in the extreme, and excepting for purposes of scientific investigation, it is better to shun the cage that holds any specimen of these creatures.

"There are now and then exceptional cases, but they are few and far between; and it is hardly possible to watch an adult baboon for many minutes without incurring a risk of some shock to the nerves. Even their exceeding cunning, and the crafty wiles which are hatched in their fertile brains, cannot atone for their habitual offences against decorum.



CHAPTER VII.

GENUS MACACUS—THE COMMON MACAQUE—THE BONNET APE—THE RHESUS OR BUNDER—THE LAPUNDER—THE WANDEROO—THE MAGOTS—THE GIBRALTAR MONKEYS—GENUS CYNOPITHECUS—THE BLACK BABOON-APE OF THE CELEBES.

VI.—GENUS MACACUS.

THE general characteristics of this genus may be briefly summarized. A square body, the limbs moderately long and very powerful. A muzzle as protruding as that of the *Cercopithec*i, a facial angle of forty to fifty degrees, the nose prominent, the thumb short, the fingers long; the former on both the fore and hind limbs have flat nails; the latter strongly curved nails. The gluteal callosities are conspicuous. The tail is of considerable length and strength; in some species it attains the length of the body, in others is very short. The hair of the head is in some species parted in the middle, in others falls down from the almost bald cranium like a peruke; in some the beard is wanting, in others it is enormously developed.

In ancient times the Macaques extended over a great part of Europe. At present the short-tailed varieties inhabit the North of Africa, China, and Japan; the long-tailed ones, the continent and islands of Southern Asia. In habits they occupy a middle position between the *Cercopithec*i and the *Cynocephali*: like the former they are found in forests, like the latter in rocks; they are as amiable as the former in youth, as morose as the latter in advanced age. They readily endure captivity, and have brought forth young in zoological gardens.

THE MACAQUE.

The MACAQUE or Javanese Ape, *Macacus cynomolgus*, (Plate II), is the best known representative of the genus. It has a body longer than the other species, a long thin tail, and hair parted or wig-like. It is most

near to the Guenons. It attains a length of four feet, including nearly two feet of tail. The beard or whisker is very short; in the male the hair lies flat, in the female it forms a kind of comb. The hair on the back is of a brownish olive-green, mixed with black, on the belly of a whitish-gray. Hands, feet, and tail are black, the face a bluish-gray, white between the eyes, of which the iris is brown. The ears are black.

The common Macaque is found in all Eastern Asia, and in very great numbers. These apes are very common in menageries, as nearly every ship from India brings some back with it. The Macaque in his native abode is social, living in bands of ten to fifteen members. They live chiefly on fruits, but have been often met on the sea-shore collecting crabs and muscles. A traveler in Java describes a scene he witnessed: "Chairs were placed for us in a grove which seemed to be the remnant of a forest. A hollow cane of bamboo was struck; this was the drum for the apes. The sound had scarcely ceased, when we heard a rustling in the trees, and more than a hundred gray apes sprang out. Great and small, old bearded patriarchs, lively young ones, mothers with their sucklings at their breast, came out and played around us like old acquaintances. They were so free from all fear that they took from our hands the rice and provisions we had brought. Two splendid males opened the baskets our attendants were carrying, and helped themselves as it pleased them. They stalked about among the crowd of apes like haughty cavaliers, and were regarded by their fellows with great respect. Nor did they hesitate to enforce the respect due to them. If the crowd pressed on them, they laid about them lustily, and kept the rest at a distance till they had satisfied their kingly appetites. To each other they were studiously courteous. When we departed, the apes again dispersed into the wood." The Macaque is not quite so agile as the Guenons, but in other respects resembles them. There is the same liveliness and cheerfulness, the same tenderness to the helpless, the same changeableness of temper. He is grateful for good treatment, and becomes attached to his keeper or master. He is naturally very modest in his appetites—a piece of bread, a handful of corn, a branch with green leaves are devoured with satisfaction; he soon learns to eat fish. But when accustomed to the luxuries of the table he proves himself an epicure in his tastes, and soon learns to prefer spirituous liquors to any other beverage. They breed freely in captivity and are passionately fond of their young. On one occasion it was found necessary to clear a cage

full of apes, among which was a young Macaque that had been separated from its mother for several months. The mother was in a cage whence she could see the other. When the keepers began to drive the apes out, she exhibited great anxiety, and uttered doleful cries when any one came near her little one. It was caught and returned to her; she at once embraced it and tenderly caressed it. They evidently had not forgotten each other.

As a performing monkey the Macaque plays many roles, but is least often exhibited as a rider. He is easily taught; not so easily as the Sphinx, but more easily than the Magot; but he is of too volatile a disposition to remember his lessons long without constant repetition.

THE BONNET APES.

The BONNET APES, *Macacus sinicus*, the Mungas of the Indians, are less frequently seen. They are considerably smaller than their kindred, the body is slender, the muzzle is prominent, the hair on the head stands out like rays from the centre of the head, the brow is bare, the coat pretty short, the color a greenish-gray, the green effect being produced by the black and yellow rings with which each of the hairs is marked. The hands and ears are black.

The Munga has a happy life in his native home in the woods of Malabar. The natives regard him as holy, and allow him the run of their fields and gardens; nay, temples are built and orchards are planted to testify their respect.

The peculiar arrangement of the hair on the head from which this species derives its name of Bonnet Ape, gives it a very unique appearance, of which the animal is quite aware, and which it seems to love to increase by the frequent grimaces in which it indulges. A variety found in the island of Ceylon (*Macacus pileatus*) is a general favorite and pet of both the natives and Europeans. The serpent-charmers teach them to dance, and earn their living by exhibiting their tricks and antics, including in their attainments that of smoking tobacco. Most apes are passionately fond of inhaling this vapor.

Sir Richard Schomburgk tells in connection with a Bonnet ape a curious anecdote illustrative of the reasoning powers of the Macaque. A Bonnet ape had bitten his keeper, and was solemnly condemned to death. Next morning the keeper proceeded to the monkey-house with

his gun. The animals were all quite familiar with the sight of the weapon, which had often been used to kill rats and vermin near their house, and no alarm was created by its appearance in the keeper's hands, except in the breast of the criminal. The other monkeys sat still, but he hid himself in his sleeping-box, from which he refused to stir. When he was, after two or three fruitless attempts, tempted out by the offer of food, and the door of the box shut behind, he fully realized his position. He rushed to and fro, examined every corner of the cage to find a loop-hole of escape, and then flung himself on the ground to await the fate which he saw coming. His comrades showed no emotion, and watched with astonishment the terrified behavior of the condemned prisoner.

THE BUNDER.

The BUNDER, *Macacus rhesus*, is another sacred creature, exceedingly revered in India. It is of a powerful square figure, thickly haired on the back. His hide forms deep folds about his neck and breast; its color is greenish with yellow or reddish flocks on the buttocks, white on the belly; the tail is greenish on the upper, gray on the lower surface. The face, hands, and ears are copper-colored, the gluteal callosities bright red.

The natives of India pay the Bunder as much respect as is shown to the Hulman or Huneman already mentioned (p. 42). Captain Johnson gives an account of his own experience with them, which is here subjoined:

"At Bindrabun (which name, I imagine, was originally Baunderbund, literally signifying a jungle of monkeys), a town only a few miles distant from the holy city of Muttra, more than a hundred gardens are well cultivated with all kinds of fruit, solely for the support of these animals, which are kept up and maintained by religious endowments from rich natives.

"When I was passing through a street in Bindrabun, an old monkey came down to the lower branches of a tree we were going under, and pulled off my Harcarrah's turban, as he was running in front of the palanquin, decamped with it over some houses where it was impossible to follow him, and was not again seen.

"I once resided a month in that town, occupying a large house on the banks of the river, belonging to a rich native; it had no doors, and

the monkeys frequently came into the room where we were sitting, carrying off bread and other things from the breakfast-table. If we were sleeping or sitting in a corner of the room, they would ransack every other part.

"I often feigned sleep, to observe their manœuvres, and the caution with which they proceeded to examine everything. I was much amused to see their sagacity and alertness. They would often spring twelve or fifteen feet from the house to another, with one, sometimes two young ones under their bellies, carrying with them also, a loaf of bread, some sugar, or other article; and to have seen the care they always took of their young would have been a good lesson to many mothers.

"I was one of a party at Teekarry, in the Bahar district; our tents were pitched in a large mango garden, and our horses were picketed in the same garden at a little distance off. When we were at dinner, a Syce came to us, complaining that some of the horses had broken loose, in consequence of being frightened by monkeys on the trees; that, with their chattering and breaking off the dry branches in leaping about, the rest would also get loose, if they were not driven away.

"As soon as dinner was over, I went out with my gun to drive them off, and I fired with small shot at one of them, which instantly ran down to the lowest branch of the tree, as if he were going to fly at me, stopped suddenly, and coolly put its paw to the part wounded, covered with blood, and held it out for me to see: I was so much hurt at the time, that it has left an impression never to be effaced, and I have never since fired a gun at any of the tribe.

"Almost immediately on my return to the party, before I had fully described what had passed, a Syce came to inform us that the monkey was dead; we ordered the Syce to bring it to us, but by the time he returned, the other monkeys had carried the dead one off, and none of them could anywhere be seen.

"I have been informed by a gentleman of great respectability, on whose veracity I can rely (as he is not the least given to relating wonderful stories), that in the district of Cooch-Bahar, a very large tract of land is actually considered by the inhabitants to belong to a tribe of monkeys inhabiting the hills near it; and when the natives cut their different kinds of grain, they always leave about a tenth part piled in heaps for the monkeys. And as soon as their portion is marked out, they come down from the hills in a large body, and carry all that is allotted for them to

the hills, storing it under and between rocks, in such a manner as to prevent vermin from destroying it.

"On this grain they chiefly live; and the natives assert, that if they were not to have their due proportion, in another year they would not allow a single grain to become ripe, but would destroy it when green. In this account, perhaps superstition has its full influence."

Of course Europeans do not acquiesce in the ravages of these apes with the equanimity or kindness of the Hindoos. It is almost impossible to keep a garden when these divinities are about. To shoot them would provoke a riot and lead to murder as it often has done; to set a guard is useless, for the apes driven off on one side return on the other; fires, scarecrows and the like do not in the least intimidate them.

One Englishman succeeded in keeping the monkeys away from his plantation for more than two years, without using any violence, or offending the prejudices of the natives.

He had planted a patch of sugar-canes, and preserved his growing crops from elephants, swine, deer, and other animals by means of a deep trench surrounding the cane-patch, and a strong palisading of bamboos just within the ditch. But the monkeys cared nothing for moat or wall, and carried off whole canes in their hands, eating them complacently as they proceeded to the shelter of the trees.

For a long time this state of things continued, and the planter was doomed to see the ripening canes devoured in his very presence, and the chewed fragments spit in his face by the robbers. This last insult proved too great a strain for his patience to endure, and after some thought, he hit upon a stratagem which answered even beyond his expectation.

He chased a flock of the monkeys into a tree, which he then felled; and by the help of his assistants, captured a number of the young, which he conveyed home. He then mixed some treacle with as much tartar-emetic as could be spared from the store, and after painting all the young monkeys with this treacherous mixture set them at liberty. The parents ran to embrace their returned offspring, and carried them off to a place of safety. There the first care of the elders was to clean the soiled coats of the little ones, by licking off the mixture with which they were smeared. The treacle delighted them, and grunts of satisfaction testified to the pleasure they felt. But only for a time; the tartar-emetic soon began to work, and reduced the apes to a piteous condition. After this

bitter experience they never came near the spot again, and left the Englishman's garden henceforth untouched.

The Bunder extends over a great part of the Indian continent, and is especially abundant in the valley of the Ganges. It is found too in the sheltered valley of the Himalaya, and has been seen near Simla even in midwinter. But it prefers the thickets of bamboo which line the banks of streams. It swims well, and never hesitates, when pursued, about plunging into water and diving some distance. Its temper is irritable and furious, and grows worse with age; his courage, when roused, indomitable. Yet in spite of these bad qualities the Bunder is a favorite with tamers and jugglers; he learns easily, while the shortness of his tail admits of his appearing in ordinary pantabans. They breed in captivity.

Many observers confuse with the Bunder a kindred species, *Macacus erythrinus*, which is more slender, but taller, with limbs nearly twice as long as the Bunder's. The two species are both Indian and resemble each other in color and habits.

THE LAPUNDER AND NELBANDER OR WANDEROO.

The LAPUNDER, *Macacus nemestrinus*, is commonly called the Swine-tailed ape from its short, thin tail. It is remarkable for the length of its hind legs. Its color is olive-brown; the face, ears, hands and callosities are of a dull flesh color. It is a native of Sumatra and the Malay Peninsula, and it is said to be tamed by the natives, who train it to gather coconuts—a task it performs with great skill, selecting only those that are ripe. It breeds in captivity. The Zoological Gardens of Berlin possessed a young ape, the offspring of this species and the common Macaque.

The NELBANDAR, *Macacus silenus*, or Wanderoo of the Hindoos, is commonly known as the Bearded Ape. It is characterized by a rich buff beard surrounding the whole face, and a moderate tail ending in a tuft. Its long hair is bright black, while the mane-like beard is white. It attains the length of three feet including ten inches of tail. It is a native of Malabar, not of Ceylon, and is very destructive to the gardens. The natives, however, value it highly, and train it to perform sundry tricks. It is good-tempered and possesses a good deal of sense. The Wanderoo, with his long white beard, is not unlike an old Hindoo. It is dignified,

thoughtful, and careful, knows when it has done wrong, and expresses its sorrow with tears. Other apes exhibit the greatest deference to the solemn Wanderoo, and always behave well when in his company.

THE MAGOTS AND GIBRALTAR MONKEYS.

Another species, *Macacus inuus*, is in some respects the most interesting of the Macaques. It is the only one found in Europe, and the absence of a tail has led some naturalists to form it into a genus by itself. The name usually given to it is the MAGOT or Barbary Ape.

Known to the ancient Greeks and Romans under the name of *Pithecius*, it seems to have been the first monkey brought into Europe; Pliny speaks of one that could play draughts, and perform other human actions, and Galen is supposed to have based his anatomy on dissection of the Magot.

As the name Barbary Ape implies, they are natives of Algeria and Morocco. They live in numerous bands on the wooded mountains which intersect these countries, and make frequent incursions into the gardens of the unfortunate natives, pillaging the orange trees and the fig trees, as well as the melon and tomato beds. These depredations are carried on with much intelligence and great precaution. They dispose themselves in *échelon* from the wall of the inclosure to a certain part of the garden, passing the plunder from one to another, as soon as collected by the most venturous. Two or three videttes, placed on an elevated spot, keep a lookout in the neighborhood. At the least sign of danger they give a cry of alarm, when the whole band quickly decamp.

When at liberty in its native lands, the Magot has a great predilection for hunting scorpions, insects, and similar creatures, and devouring them on the spot. It displays peculiar aptitude for discovering and pouncing upon its prey.

Scorpions and beetles are found in profusion under stones, logs, or in similar sheltering places, and are there secure from any ordinary foe. But the quick senses of the Magot detect them in their concealment, and the ready hands sweep away the shelter and make the insect prisoner before it recovers the sudden surprise of its violated roof.

To any ordinary animal the scorpion would be rather a dangerous prey, and would probably avenge its death most fully by a stroke of its torture-giving and swiftly-lashing tail. The Magot, however, has

hands which can overmatch even the scorpion's tail, and no sooner is one of these baneful creatures brought to light, than the monkey pounces upon it, twitches off the poison-joints of the tail, and then, grasping the disarmed scorpion, eats it as composedly as if it were a carrot.

The enemies which these creatures hold in greatest dread are the climbing felidæ; and on the approach of one of these animals, the colony is instantly in a turmoil. The leaders yell their cry of alarm and give the signal for retreat, the mothers snatch up their little ones, the powerful males range themselves in battle array, and the whole body seeks a place of refuge.

The color of the Magot is a clear gray. The head is strong and heavy, the eyes deeply set, the neck short and powerful, the teeth sharp, the nails strong; the face is always old-looking. It is not often seen in zoological gardens, but it displays in captivity a strong attachment to its master, and a fondness for nursing other animals, especially if they are young and helpless. It carries them in its arms, keeps their coats clean and free from vermin, and is jealous if interfered with.

Gibraltar is the spot in Europe where the Magots have been since time immemorial. Some writers suppose that they have been on the rock since the time when the Straits did not exist; the Moors assert that there is an underground passage between the Spanish and African shores which the Magots traverse. Most probably they were introduced by the Moorish invaders of the Peninsula. They live on the summit of the rock, and move about from place to place to escape the wind. Great care has been taken of them by the English authorities, and their numbers are reported to the Quartermaster of the garrison. In spite of all care, however, their numbers had dwindled down to ten in 1856, and in a few years had fallen to four, all of the same sex, and finally to three. Alarmed by this report, Brehm wrote to the English governor of the fortress, and had his fears removed by the following answer: "The number of apes which at present inhabit the Rock amounts to eleven. As it has been found that they can easily find sufficient food on the rock, they are not fed, but left to themselves. The signal-man looks after them, and prevents them from being chased or disturbed. He keeps an account of them, and, as they are always together, is well informed concerning them and their movements.

"When and how they came to the Rock nobody knows, but the most

opposite views are held. Six or seven years ago they were reduced to three; but Sir William Codrington, fearing that they would entirely perish, brought over three or four from Tangiers, and since then they have increased to the number above stated."

Europe, therefore, has not yet lost her apes.

VII.—GENUS CYNOPITHECUS.

This genus has one species, *Cynopithecus niger*, which is assigned by many writers to the genus *Macacus*: it resembles the Macaques, and also has several characteristics of the *Cynocephali*, and many naturalists follow Cuvier in classing it with the latter. Recent investigations, however, have led most naturalists to make a separate genus of it as above.

It differs from the Dog-heads proper by possessing a very rudimentary tail, and in its muzzle, which is broad, flat, and, unlike that of the species in the genus *Cynocephali*, does not overhang the upper lip. The face and callosities are bare, the body covered with long woolly black hair, which on the head grows pretty long, and forms a kind of crest, which curves backward over the neck like the crest of a cockatoo. The Budeng (p. 44) also possesses a crest, but it curves forward.

It attains the length of two feet, and is abundant in the Celebes, Philippine and Molucca Islands. Its habits in its native abodes are little known; in captivity it shows itself domineering and tyrannical toward the Guenons, pretty kind toward the Macaques, and quite friendly to a young female baboon.



CHAPTER VIII.

THE NEW WORLD MONKEYS.

THE AMERICAN MONKEYS OR CEBIDÆ—THE GENUS CEBUS OR SAPAJOU—THE GENUS LAGOTHRIX—
THE SPIDER MONKEYS—THE GENERA ATELES AND ERIODES—THE HOWLING MONKEYS—THE
SAKIS—THE NIGHT MONKEYS—THE TEE-TEES.

THE difference between the animals of the OLD and NEW WORLDS is most strikingly seen in those of the torrid zone. In America the land between the tropics forms a world of its own. Soil and climate, light and air, plants and animals all bear a peculiar stamp, only here or there calling up reminiscences of the Eastern Hemisphere. And this is to a great extent the case with reference to the animals we are now about to describe. The CEBIDÆ are PLATYRRHINI, or “flat-nosed” monkeys; they are more inoffensive, good tempered and melancholy than the apes of the old world; they are distinguished from their brethren in the Eastern Hemisphere by the conformation of their bodies and limbs, and by their teeth. The nostrils are very different from those of the monkeys which have already been described, as they open at the sides instead of underneath, and are separated from each other by a wide piece of cartilage. The body is slender, the limbs long, the tail is never absent, and in most genera is supplied with powerful muscles which enable the creature to seize anything by it. The thumb of the fore hands is not so truly “opposable” as in the feet. The nails are flat. The number of molars is increased by one on each side of each jaw; that is, the “dental formula” becomes

$$I. \frac{2-2}{2-2}, C. \frac{1-1}{1-1}, M. \frac{6-6}{6-6} = 36.$$

They have no cheek pouches or callosities. One member of the family alone attains any considerable size. Their colors are not so varied as those of Asia and Africa.

The CEBIDÆ are confined to South America. Their northern limit is the Caribbean Sea, but they are not found in any of the Islands, nor do they pass the Isthmus of Panama. To the West they are limited by the chain of the Andes, on the East by the Atlantic Ocean, and South by the twenty-fifth degree of latitude.

The APES OF AMERICA are exclusively arboreal, and the primeval forest is their natural home. They prefer well-watered regions. They never descend to the earth except in extreme need; even when they drink they climb on some bending branch which droops into a stream. Some of these apes can traverse hundreds of miles and never set foot on ground. The forest gives them all they want, buds and fruits, insects and birds' eggs, young birds and honey.

Most species are active by day, some are genuine night-animals. They all are timid and shy and cannot distinguish with the sagacity of OLD WORLD APES between real and imaginary danger. Hence they flee from everything unusual. They are weak, and only able to defend themselves from small beasts of prey.

In captivity they are docile and affectionate in youth, cunning and malicious in old age. Maternal affection is very strong in the females. They bear one or two young ones, and nurse, tend and guard them with that care and devotedness which always excite our admiration and esteem.

They do little damage to mankind; their home is usually remote from the operations of man, and those which do levy toll on the plantations are merciful in their exactions. Men hunt them for the sake of their flesh and their skin; the natives slay them by hundreds, using bows and arrows, or the blowpipe, by which they can project their poisoned darts that kill with a scratch, over a hundred feet. With the same weapon the Indians capture them. "If the Arecunas," writes Schomburgk, "wish to tame an old obstinate ape, they dip their dart in weakened Wurari poison. When the creature falls down, the wound is sucked, the animal buried in the earth up to the neck, and a strong solution of some salt-petre-bearing earth or of sugarcane-juice is poured over him. When the patient shows signs of revival he is taken out and wrapped like a child in swaddling-clothes. In this straight-jacket his drink for some days is cane-juice and his food is seasoned with Cayenne pepper, and boiled in salt-petre water. If this heroic treatment does not answer, he is hung up in the smoke. His temper then improves, his eyes become beseeching,

he asks for mercy. He is set free, and the most violent ape seems to forget that he has ever been a denizen of the forest."

The CEBIDÆ are divided into four sub-families which bear the names of CEBINÆ, MYCETINÆ, PITHECINÆ, and NYCTAPITHECINÆ, and contain *ten* genera in all.

The sub-family of CEBINÆ contains *four* genera, the first being the richest in species of all the American monkeys, and ranges from Costa Rica to Paraguay.

I.—GENUS CEBUS.

The SAPAJOUS are small, rather slim creatures. They live in bands in the forests of Colombia, Peru, Guiana, Brazil, and Paraguay, usually keeping to the highest branches of the trees. They feed on fruits, insects, worms, molluscs, eggs, and even small birds. Several species of Carnivora and serpents persecute them incessantly; the latter more particularly inspire them with terrible fear.

The Sapajous possess an unequalled amount of agility and petulance, and are capricious to excess. At the same time they are very intelligent, very gentle, and very familiar, and disposed to be affectionate towards those who take an interest in them. Thus it is that they are in demand in all civilized countries; in the hands of mountebanks and wandering musicians they become objects of amusement to the multitude. They are trained to a great number of tricks, which they execute with great coolness and imperturbable gravity. They may be called the Green Monkeys of the New World. They are sometimes styled the WEEPER Monkeys, from the low whining sounds they often utter. Plaintive and mournful as are these cries, they are expressions of satisfaction and good temper. The slightest emotion produces a screaming and screeching painful to listen to. They are also called Musk Apes from a musky odor which some of them exhale.

It is very difficult to ascertain the number of species in this family. Schomburgk writes: "No genus of apes shows in size, color and growth of hair more differences than these do, and hence a crowd of species is created which are mere varieties arising from a cross between the Capucin and the Apella." But the number of observations that have been made of these creatures in captivity lead us to prefer more numerous divisions than the two to which apparently the intrepid traveler would restrict us. We follow Wallace in regarding the genus as divided into *eighteen* species.

THE CAPUCIN MONKEY.

The CAPUCIN monkey, *Cebus capucinus* (Plate II., Sapajou), bears in its own home—the southern portion of Brazil—the name of CAI or SAI, a word which is said to mean in the language of the Guarani Indians, “a dweller in the forest.” It is one of the larger varieties of the group, and has attained in some instances a length of eighteen inches in the body and fourteen inches in the tail. It is distinguished by its bare, wrinkled, flesh-colored forehead. A brown, more or less deep, is the predominant color, the thinly covered temples, side-whiskers, throat and chest are somewhat lighter.

The *Cebus hypoleucus* resembles the Capucin in size, and differs only slightly in color. But the brow is hairy, and the color on the cheeks, throat and other parts are of a bright yellow color, contrasting strongly with the dark-brown hide.

A variety, *Cebus olivaceus*, is somewhat larger than those just mentioned; the body measures two feet in length, the tail twenty inches. The face and forehead are thickly covered with hair, a broad dark-brown stripe crosses the brow, and from it a gradually widening triangular patch of like color extends to the back of the head. The back is brown in color; the cheeks, shoulders and fore-limbs a pale olive-brown.

A thick growth of hair above the eyebrows covers as with a wig the head of *Cebus leucogenys*, a Brazilian species. Its long silky hair is of a grayish-black hue; the hair on the cheeks changes from bright yellow to yellowish-white.

These species differ little from each other. They are found everywhere in the torrid zone, from Bahia to Colombia and across the Andes. They pass their life in trees and are careful to avoid the observation of travelers. Usually they occur in bands of five to ten, most of which are females.

In their habits, too, all the species are very similar, so that the description of one will serve equally for any other. In consequence of their sportive manners they are frequently kept in a domesticated state, both by the native Indians and by European settlers. Like several other small monkeys, the Capucin often strikes up a friendship for tame animals that may happen to live in or near its home, the cat being one of the most favored of their allies. Sometimes it carries its familiarity so far as to

turn the cat into a steed for the nonce, and, seated upon her back, to perambulate the premises. More unpromising subjects for equestrian exercise have been pressed into the service by the Capucin. Humboldt mentions one of these creatures which was accustomed to catch a pig every morning, and mounting upon its back, to retain its seat during the day. Even while the pig was feeding in the savannahs its rider remained firm, and bestrode its victim with as much pertinacity as Sinbad's old man of the sea.

Their food is chiefly of a vegetable nature, but they are fond of various insects, sometimes rising to higher prey, as was once rather unexpectedly proved. A linnet was placed, by way of experiment, in a cage containing two Capucin monkeys, who pounced upon their winged visitor, caught it, and the stronger of the two devoured it with such avidity that it would not even wait to pluck off the feathers. Eggs are also thought to form part of the Capucin's food.

The *Cebus apella*. This species is the representative of the Capucin monkey in Guiana. It varies much in color; the hair over the brow and on each side of the head swells up into a tuft, and on the face is prolonged to form a beard. It is found in large troops of several hundreds; Schomburgk saw one consisting of four or five hundred members. The Indians shoot them with their blowpipes as articles of food, and keep numbers of tame ones about their huts.

It is this ape which we usually see accompanying the barrel-organ of our peripatetic musicians, and which climbs up our piazzas and spouts to reach the nursery windows, and collect the children's cents. Its health does not seem to suffer much in captivity, but it is dirty and melancholy and continually pulling frightful faces.

The species commonly called the HORNED SAPAJOU or MIKO, *Cebus fatuellus*, is found on the East Coast of Brazil, and is remarkable for the peculiar growth of the hair on its head. It attains the size of a large cat, has strong muscular limbs, a round head and face, a tail longer than its body and thickly covered with hair. The cheeks and sides of the temples are decked with fine whitish-yellow hair, while the face is surrounded with a ring of bright black hair; on the head there grows a thick tuft divided into two bunches. Between the bunches the hair is short and black, on the neck it is brown, beneath the chin dark-brown, on the throat, breast, neck, and sides yellowish-brown, on the rest of the body black-brown, almost black. The hairless face has a dirty flesh-colored

hue, the hands and feet are brown, and the fingers are clothed with light-brown hairs. The peculiar growth of hair on the head does not appear till middle age, when it is found in both sexes, but more developed in the males. It is exceedingly active and sagacious, travels in bands of thirty or forty, and plunders remorselessly the plantations of settlers near the forest.

The other species require no mention in a work of a popular character.

II.—GENUS LAGOTHRIX.

This genus is distinguished from the preceding one by its squarer figure, some peculiarities in the skeleton and teeth, and the woolly hair, from which latter characteristic it derives its name *Lagothrix*. It is found in the districts on the headwaters of the Amazon and Orinoco, and lives in groups in trees. All the kinds described by travelers are regarded by naturalists as capable of being embraced in *five* species. We give the best known and attested species.

The BARRIGUDO, *Lagothrix Humboldtii*, is when fully grown little less than the Howling Monkeys. Its soft woolly hair grows long on the tail, the thighs, and the upper arm, and becomes a regular mane on the breast; the head looks as if cropped. The face, and the hands, both palm and back, the bare spot on the tail, and the tongue are negro-black; the eyes dark-brown, the coat dull-black on the head, somewhat lighter on the back; on the further end of the tail a dark brownish-yellow.

Tschudi describes the BARRIGUDO—as the natives name them—as malicious and daring, often following for a long distance the Indians who carry the productions of remote plantations to market in the upper valleys. The apes pelt them with twigs and branches. They are bad climbers, and all their movements are slow and deliberate. When brought to bay, they put their backs against a tree and fight till death. The Indians hunt it for its flesh. In captivity it is a gentle creature, but seldom survives removal from its home; even the change to Para is usually fatal. One in the Zoological Gardens of London is described as amiable and attractive; in all its actions it equally avoided haste and sluggishness, and displayed grace and precision; a solemn attitude seems natural to it, and suits well. In distinction from the Spider apes and Cebidæ, which are always whimpering or whining, the Barragudo utters only *one* cry like a sharp “Tsha” not repeated.

We now proceed to a genus the members of which may be described as the Gibbons of the New World. They have not, however, the lightning-like spring and activity of those acrobats of the Eastern Hemisphere.

THE SPIDER-MONKEYS.

This appellation, bestowed by early naturalists on the following genera, well expresses their leading features, which suggest the comparison to every observer.

III.—GENUS ATELES.

The various species of this genus inhabit South America as far as twenty degrees of South latitude. Their name *Ateles* is a Greek word signifying "imperfect," and is bestowed on them because the thumbs on their fore-limbs are useless. They are usually found in small bodies of ten or twelve. The *fourteen* species do not present much difference to each other.

THE COAITA AND THE MARIMONDA.

The COAITA, *Ateles paniscus*, is one of the larger apes of the genus; it attains the length of four feet, more than one half being tail. The hair is long on the shoulders, and forms a crest on the head; it is deep black, except on the face, where it is red. A pair of lively brown eyes give a pleasing expression to its visage. It is averse to the intrusion of strangers, and large bands assault the stranger by pelting him with sticks. It is a native of Guiana.

The MARIMONDA, *Ateles Beelzebub*, is a species which has been found in Guiana, and, according to Humboldt, chiefly in the Spanish province.

In captivity, the Marimonda is a gentle and affectionate animal, attaching itself strongly to those persons to whom it takes a fancy, and playing many fantastic gambols to attract their attention. Its angry feelings, although perhaps easily roused, do not partake of the petulant malignity which is found in the baboons. Very seldom does it attempt to bite, and even when such an event does take place, it is rather the effect of sudden terror than of deliberate malice.

On account of its amiable nature it is often brought into a domesticated state, and, if we may give credence to many a traveler, is trained to become not only an amusing companion, but a useful servant.

The color of this animal varies much according to the age of the individual.

When adult, the leading color is of a uniform dull black, devoid of the glossy lustre which throws back the sunbeams from the Coaita's furry mantle. On the back, the top of the head, and along the spine, the hair is of a dense, dead black, which seems to have earned for the animal the very inapposite name with which its nomenclators have thought fit to decorate the mild and amiable Marimonda.

The throat, breast, inside of the limbs, and the under side of the tail are much lighter in tint, while in some individuals a large, bright chestnut patch appears on each side.

It seems to be of rather a listless character, delighting to bask in the sun's rays, and lying in the strangest attitudes for hours without moving. One of the postures it best loves is achieved by throwing the head back with the eyes turned up, and its hands behind its head.

THE CHAMECK.

The CHAMECK, *Atles pentadactylos*, is the representative of the genus in Peru and parts of Brazil. It bears the epithet of *Pentadactylos* or five-fingered (Greek, *pente* five, *daktylos* finger), because the thumb is slightly projecting; it has, however, only a single joint, and is not furnished with a nail, justifying its other designation of *ateles*. The body measures about twenty inches; its tail is over two feet in length, and is the most conspicuous member of the animal. For the greater part of its length it is thickly covered with long drooping fur, but the last seven or eight inches are nearly denuded of hair on the upper surface, and entirely so on the lower.

The color of the Chameck is nearly black, and of a uniform tint over the head, body, and limbs. Its hair is rather long and thick, in some parts taking a slight curl. The head is very small in proportion to the rest of the body. The face is of a deep brown color, as are the ears, cheeks, and chin, on which some long black hairs are scattered at distant intervals.

THE GOLD-BROWED APE.

BARTLETT'S MONKEY, *Ateles bartlettii*, is the prettiest of all the spider-monkeys. Its hair is long, of a deep black color on the back, and brownish-yellow on the belly; its whiskers are white, and across the brow runs a golden-yellow band. From this remarkable feature it derives an additional name to that given it in honor of its discoverer, and is styled the Gold-browed Ape.

IV.—GENUS ERIODES.

This genus, containing only *three species*, is intermediate between the two previous genera, and is confined to the Eastern parts of Brazil, South of the Equator.

THE MIRIKI.

The MIRIKI, *Eriodes hypoxanthus* (Plate II, Spider Monkey), inhabits the interior of Brazil, and is the largest of the Brazilian monkeys. It is strongly built, small-headed, short-necked, long-limbed, and thickly-haired. Its hair yellowish; the face in middle age flesh-colored, in old age gray. The hair of this species is very thick, short, and furry, of a tolerably uniform brown tint over the head, body, and limbs, the paws being much darker than the rest of the animal. There is a slight moustache formed by a continuation of the long black hairs which are scantily planted on the chin and face. On account of the thick coating of fur with which the skin of this animal is covered, water has but little effect upon it. Knowing this wet-repellent property, the hunters of Brazil are accustomed to make the skin of the Miriki into cases wherewith to cover the locks of their guns on rainy days.

This species is easily distinguishable from its companions by the presence of a better developed thumb on the fore-paws than falls to the lot of spider-monkeys generally.

The characteristics of these species are in the main the same. They are all climbers, and endowed with the same faculty of using the tail as a fifth hand. The story told by the old travelers, Dacosta and Dampierre, of their forming a bridge across rivers, has been doubted by later ob-

servers. In captivity they are gentle, but the following story of a Spider Monkey possessed by a British officer, shows that they are sometimes prone to human frailties :

At Belize, Sally was permitted to range the town at large for some days. One morning, as her master was passing along the streets, he heard high above his head a little croaking sound, which struck him as being very like the voice of his monkey ; and on looking up, there was Sally herself, perched on a balcony, croaking in pleased recognition of her friend below.

Once, and once only, poor Sally got into a sad scrape. Her master was going into his cabin, and found Sally sitting all bundled together on the door-mat. He spoke to her, and the creature just lifted up her head, looked him in the face, and sank down again in her former listless posture.

"Come here, Sally," said the captain.

But Sally would not move.

The order was repeated once or twice, and without the accustomed obedience.

Surprised at so unusual a circumstance, her master lifted her by the arms, and then made the shocking discovery that poor Sally was quite tipsy. She was long past the jovial stage of intoxication, and had only just sense enough left to recognize her master. Very ill was Sally that night, and very penitent next day.

The reason for such a catastrophe was as follows :

The officers of the ship had got together a little dinner-party, and being very fond of the monkey, had given her such a feed of almonds and raisins, fruits of various kinds, biscuits and olives, as she had not enjoyed for many a day. Now of olives in particular, Sally is very fond, and having eaten largely of these dainties, the salt juice naturally produced an intense thirst. So, when the brandy and water began to make its appearance, Sally pushed her lips into a tumbler, and to the amusement of the officers, drank nearly the whole of its cool but potent contents.

Her master remonstrated with the officers for permitting the animal to drink this strong liquid ; but there was no necessity for expostulating with the victim. So entirely disgusted was the poor monkey, that she never afterward could endure the taste or even the smell of brandy. She was so thoroughly out of conceit with the liquid that had wrought

her such woe, that even when cherry-brandy was offered to her, the cherries thereof being her special luxury, she would shoot out her tongue, and with just its tip taste the liquid that covered the dainty fruits beneath, but would not venture further.

She seemed to bear the cold weather tolerably well, and was supplied with plenty of warm clothing, which stood her in good stead even off the icy coasts of Newfoundland, where, however, she expressed her dislike of the temperature by constant shivering. In order to guard herself against the excessive cold, she hit upon an ingenious device. There were on board two Newfoundland dogs. They were quite young, and the two used to occupy a domicile which was furnished with plenty of straw. Into this refuge Sally would creep, and putting an arm round each of the puppies and wrapping her tail about them, was happy and warm.

She was fond of almost all kinds of animals, especially if they were small; but these two puppies were her particular pets. Her affection for them was so great that she was quite jealous of them; and if any of the men or boys passed nearer the spot than she considered proper, she would come flying out of the little house, and shake her arms at the intruders with a menacing gesture as if she meant to annihilate them.

THE HOWLING MONKEYS.

The next sub-family, the MYCETINÆ, contains only one genus, MYCETES, which, however, is subdivided into *ten* species. They range from Guatemala to Paraguay.

V.—GENUS MYCETES.

Oken's *dictum* that the largest animals of each family is also the most perfect, is true in the case of these monkeys, which are better known by their English name of the HOWLING MONKEYS. They attain a length of three feet in the body, with a tail still longer. Their form is slender but compact, the limbs well proportioned, the hands five-fingered, the head large, the chin provided with a beard. They derive their common name from the howling with which they fill the forest, and which can be heard for miles.

The instrument by means of which the Howlers make night dismal with their wailings, is the "hyoid bone," a portion of the frame which is

developed largely in these monkeys. In man, the bone in question gives support to the tongue and is attached to numerous muscles of the neck. In the Howling Monkeys it takes a wider range of duty, and, by a curious modification of structure, forms a bony drum which communicates with the windpipe and gives to the voice its powerful resonance.

The larynx has six sacks connected with it, in which the voice is received; two of these are of considerable size, and resemble the crop of birds. The tail is long, bare at the extremity, nervous and muscular.

The HOWLERS inhabit almost all the countries of South America; even those elevated regions where heavy frosts occur in winter, and do not suffer from the cold rains. Cattle perish, but the first bright day brings out the voice of the HOWLERS, and they may be seen climbing to the tops of the trees to dry themselves in the warm sunbeams.

THE RED AND BLACK HOWLERS.

The ALUATE, or RED HOWLER, *Myctes seniculus*, has a reddish-brown fur, inclining to yellow on the back; the hair is short, stiff, and uniform. The female is smaller and darker. It inhabits the whole East of South America.

The BLACK HOWLER, *Myctes Caraya* (Plate III), is a native of Paraguay. The hair is long and black, inclining to red at the sides; in the female, yellowish on the belly. It is rather less than the Red Howler.

HABITS OF THE HOWLING MONKEYS.

The habits of the two species are so much alike that the descriptions of travelers apply equally to both. Schomburgk gives a lively account of his observations of a herd of Howlers. "I followed the sound, and after great exertions got within view of the troop without being perceived. They sat before me on a high tree and performed the most frightful concert that can be imagined, every beast of the forest seemed engaged in deadly strife; at times the tones were like the grunting of a pig, the next moment the roar of the jaguar as he springs on his prey, then the low, awful growling of that beast of prey when, surrounded on all sides, he recognizes the presence of danger. The performers would stop suddenly, as if a signal had been given, and then quite unexpectedly a singer would raise up his inharmonious voice, and the howling recom-

menced. The throat-drum which gives the voice its strength could be seen moving up and down during their yells. Yet this concert had its laughable aspect; the most misanthropic of mankind must have smiled had he seen the solemn gravity and earnestness with which the bearded performers looked at each other. The natives say that each band has a leader, distinguished by the shrillness of his voice and the gracefulness of his figure. The shrillness was evident; the gracefulness I looked for in vain. I saw, however, two apes that were silent, and whom I supposed to be sentinels."

Hensel writes: "The Howling monkeys live in little troops of five to ten members, and seldom quit the same spot. An old male appears to lead them." Humboldt, however, has seen as many as forty together, and reckoned that there might be as many as two thousand in a quarter of a mile square. He remarks the strange uniformity of the actions of all the members of a band. What one does, all do. When the leader quits a branch, all the family quit it. If the leader suspends himself by the tail and swings himself to and fro to reach a neighboring bough, the whole band assume the same attitude and perform the same motions. They do not, like the old world monkeys, spring from tree to tree; they never quit one branch with their tail till they have got good hold with their hands, and never let go their hands till their tails have a firm grasp. The muscles of the tail are like a watch-spring and coil up the end of that appendage when at liberty; the creature can hang by its tail till it is quite dead, and it possesses a tenacity of life unexampled except in some of the *Carnivora*.

The same writer, Hensel, describes the difficulty of dispatching one. The first shot broke a hind leg and injured the tail; a second, went through the belly, causing such a gaping wound that the entrails protruded; a third, through the chest; a fourth, through the throat, carrying away part of the underjaw and destroying the howling apparatus, and a fifth was necessary to put the miserable creature out of its anguish. To the last it hung by its wounded tail. As we have said, the under surface of the tail is devoid of hair and has a velvety surface, and when two turns of the tail are cast about a branch the animal remains suspended even in death. Hence Europeans are not very successful in procuring specimens of these apes. A musket-ball seldom hits a part so vital that consciousness is immediately destroyed, and as long as consciousness remains the ape instinctively grasps some limb with his tail; the poisoned

arrows of the Indians, on the other hand, produce an instantaneous loss of consciousness, and the insensible victim falls helpless to the ground.

They are sometimes caught by an ingenious stratagem. A certain plant, the "*Leecythis*," produces a kind of nut, which, when emptied of its contents, becomes a hollow vessel with a small mouth. Into one of these hollowed nuts a quantity of sugar is placed, the nut left in some locality where the monkey is likely to find it, and the monkey-catchers retreat to some spot whence they can watch unseen the effect of their trap.

So tempting an object cannot lie on the ground for any length of time without being investigated by the inquisitive monkeys. One of them soon finds out the sweet treasure of the nut, and squeezes his hand through the narrow opening for the purpose of emptying the contents. Grasping a handful of sugar, he tries to pull it out, but cannot do so because the orifice is not large enough to permit the passage of the closed hand with its prize. Certainly, he could extricate his hand by leaving the sugar and drawing out his hand empty, but his acquisitive nature will not suffer him to do so. At this juncture, the ambushed hunters issue forth and give chase to the monkey. At all times, these monkeys are clumsy enough on a level surface, but when encumbered with the heavy burden, which is often as big as the monkey's own head, and deprived of one of its hands, it falls an easy victim to the pursuers.

Young ones are often captured by the cruel device of shooting a nursing mother, who even when dying clasps her loved little one to her bleeding breast. At times, indeed, she rises to the tragic grandeur of sacrificing her maternal instincts, and dying without the consolations of her offspring's embraces in order that it may have a chance of liberty. Spix relates that he had mortally wounded a female, who carried her progeny on her back. The poor parent fell from branch to branch, and the young one would undoubtedly have perished with her, had not she, collecting all her strength, and desperate in her anxiety and tenderness, thrown it with a fast-failing arm, on to a high branch, and in this way succeeded in preserving it from the unhappy fate which befell herself.

By a strange, or rather by the natural injustice of human judgment, this action is often alleged as a proof that the female of the *Mycetes* is devoid of maternal affection.

In Paraguay these monkeys are regularly hunted for their skins and flesh. Francia, the dictator, had his grenadiers' caps made of skins from the Black Howler, and the natives use them for shabracques, saddle-bags

and the like. Travelers are sometimes compelled to eat the flesh, to their disgust at first. "Nothing can be more repugnant than the sight of such a repast," writes Schomburgk; "it looks as if one was a guest at a cannibal banquet where a child was the chief dish." They are spitted and roasted whole.

THE SAKIS.

The sub-family Pithecinæ is the next division of the American Apes, and embraces those genera in which the tail is covered with hair and is incapable of grasping anything, or coiling round a branch.

The apes of this sub-family, or Sakis, have a compact figure which appears thicker than it really is, owing to the long and dense covering of hair; the limbs are strong, the tail bushy and usually with very long hair down to the end. The hair on the top of the head is thick and parted in the middle; that on the cheeks and chin grows into a strong beard of less or greater length. They are distinguished by the dental structure: the three-cornered canine teeth are separated from the incisors, which are pressed closely together, fine at the points, and inclined towards each other.

The habitat of the few members of this group is confined to the northern part of South America. They dwell in high, dry woods free from brush, and avoid other species of apes. They are called by Tschudi twilight animals, whose active life begins at sundown and continues to sunrise. Schomburgk, however, states that his personal observations contradict this account of their nocturnal habits. "Wherever the foliage was thick I found herds of apes, in which the *Pithecia* formed the greatest number; their long, graceful hair, the dignified beard, and the bushy fox-tail give these creatures a pleasant, but laughable appearance."

VI.—GENUS PITHECIA.

The name SAKI, often applied to all the apes of the sub-family, belongs more properly to the second species described below.

The animals of the genus *Pithecia* bear much resemblance to the *Cebinæ*; they live on fruits and insects, and are very partial to honey, being always on the lookout for the hives of wild bees. The Sapajous,

who are aware of this weakness, follow them at a distance, watching for an opportunity to rob them of their booty. As soon as the Sakis sit down to eat the honey they have discovered, the Sapajous, profiting by their physical superiority, spring upon them, and put them to flight: after which they enjoy the booty they have obtained so easily.

The Sakis are generally gentle, but excessively timid, and for this reason are difficult to tame, though they are not destitute of intelligence. They manifest great solicitude for their young, and both male and female carefully occupy themselves in rearing them. But after a certain time they chase them away, and compel them to provide for themselves. The whole genus is often named, from their bushy tails, "The Fox-tailed Monkeys." The number of species is *seven*.

The SATAN APE or CUXIO, *Pithecia satanas*, the most common representative of the genus, is found on the upper Amazon and Orinoco rivers. It measures sixteen inches in length, and its tail is nearly as long. The quite round head is covered with a kind of cap of long, thick hair, which seems to radiate from a central pivot on the occiput, parting in front. The cheeks and chin are covered with a long black beard. The back is thickly haired, the tail very bushy. The adults are of a black color, inclining on the back to brown; the young are of a grayish-brown tint. Varieties are numerous.

This species has been named by the Europeans the Satan Ape; the Indians call it the Cuxio. It is said to be very careful of its beard, and will not put its face down to drink for fear of wetting it. It scoops up the fluid in the palm of its hand when it is living in freedom, but in captivity it drinks like other apes. It is fierce in temper, and easily provoked; when angry, it rubs the end of its beard and dashes on its foe. Its teeth are so strong that it can drive them into a stout plank.

The WHITE-HEADED Saki or BLACK YARKE, *Pithecia leucocephala*, (Plate III), presents very different appearances at different ages, and hence has obtained many different names. It is elegant in form, and more varied in color than the Cuxio. The head is surrounded with a thick fringe of white hair; the top of the head is deep black. It is a remarkable fact that the white hair round the face is short in the male, but long and drooping in the female.

The so-called SHAGGY APE, *Pithecia hirsuta*, or Paranam, attains the length of forty inches, of which half consists of the tail; the body is cov-

ered with hair nearly four inches long, the points of which turn forward; the hair hangs over the brow, partly hiding the face. Spix discovered this species near the Rio Negro, and describes it as nocturnal in its habits.

VII.—GENUS BRACHYURUS.

This genus is characterized by the short rudimentary tail (hence its name from the Greek, *brachys* short, and *oura* tail) and the slight beard, the egg-shaped head and the flat face. The teeth are peculiar. In the upper jaw the central incisors are twice as long and broad as the exterior ones; in the lower jaw they are shorter. The canine teeth are short and strong. Its short tail contains fourteen to seventeen joints. It embraces *five* species.

The BLACK-HEADED Saki or CACAJAO, *Brachyurus melanocephalus*, measures about two feet, including six inches of tail. Its shaggy coat is yellow-brown, brighter on the breast and stomach, but black on the head and tail and fore-feet; the ears are hairless and very large. Little is known of its habits when wild; in captivity it is docile and sluggish. Fruit is its chief food, and when eating it bends over its food in a peculiar manner, and is awkward in using its fingers. It is not common even in its native abodes on the Rio Negro.

Many names have been given it, the most common being the one we have mentioned; it is also called Chucato, Chucazo, Carniri and Monofo, which is, by interpretation, "The Hideous Ape."

The species named the SCARLET-FACED SAKI, *Brachyurus calvus*, has a tail still shorter than the Cacajao; it is nearly a pear-shaped stump. The dull-yellow of his coat inclines to dull-white on the back, and to bright-yellow on the belly. In old specimens the color is almost white, from which the face stands out conspicuously; it is scarlet-red, with bushy yellow eyebrows and reddish-yellow eyes; the hair on the head looks as if it had been closely cropped, in marked contrast to the long hair on the back. From its appearance it has received the name given above; the native name is UAKARI.

It is found in a small district near the mouth of the Japura river, and can with great difficulty be removed from its home. The natives represent its motions as active, and capture it by means of the blowpipe and weakly-poisoned darts. It is hard to tame, and repulses all efforts to

caress it. After a few days or weeks of captivity, it becomes indifferent to everything, refuses food, and slowly pines away. Many of them die of inflammation of the lungs. During sickness the bright scarlet of the face becomes duller, but the red tint does not entirely disappear till about two hours after death. Deville saw one in captivity which was kindly disposed to white men, but could not endure Indians. It lived on fruits, and drank from a cup which it held in both hands. Although quite tame, it exhibited a great longing for freedom, and made every effort to escape.

The sub-family Nyctipithecinae contains *three* genera of small and elegant monkeys, with long hairy non-prehensile tails.

VIII.—GENUS NYCTIPITHECUS.

These night monkeys have large eyes, nocturnal habits, and are rather lemurine in appearance. *Five* species have been described; the best known is

THE DOUROUCOULI.

The DOUROUCOULI, *Nyctipithecus trivirgatus*. The word Nyctipithecus or Night Ape, which is used as the generic title of the Douroucouli, refers to its habits, which are more strictly nocturnal than those of the animals heretofore mentioned. The eyes of this little creature are so sensitive to light that it cannot endure the glare of day, and only awakes to activity and energy when the shades of night throw their welcome veil over the face of nature.

In its wild state, it seeks the shelter of some hollow tree or other darkened place of refuge, and there abides during the hours of daylight, buried in a slumber so deep that it can with difficulty be aroused, even though the rough hand of its captor drag it from its concealment. During sleep, it gathers all its four feet closely together, and drops its head between its fore-paws. It seems to be one of the owls of the monkey race.

The food of this Douroucouli is mostly of an animal nature; and consists chiefly of insects and small birds, which it hunts and captures in the night season. After dark the Douroucouli awakes from the torpid

lethargy in which it has spent the day, and shaking off its drowsiness, becomes filled with life and spirit. The large dull eyes, that shrank from the dazzling rays of the sun, light up with eager animation at eventide; the listless languor is discarded, and it commences its nightly chase.

The general color of the Douroucoulis is a grayish-white, over which a silvery lustre plays in certain lights. The spine is marked with a brown line, and the breast, abdomen, and inside of the limbs are marked with a very light chestnut, almost amounting to orange. The face is remarkable for three very distinct black lines, which radiate from each other, and which have earned for the animal the title of *trivirgatus*, or "three-striped." There are but very slight external indications of ears, and in order to expose the organs of hearing, it is necessary to draw aside the fur of the head. On account of this peculiarity, Humboldt separated the Douroucoulis from its neighbors, and formed it into a distinct family, which he named "*Aötes*," or "Earless."

It is rather uncommon, a fact which some writers attribute to its living in a state of virtuous monogamy; they affirm that a pair may be found snugly sleeping in one bed, but never greater numbers, unless there be a little family. But Bates, a very careful observer, denies this, and asserts that larger troops are not rare. It has a loud cry, and can hiss, spit, and mew like a cat.

IX.—GENUS *SAIMIRIS*.

The *SAIMIRI* or SQUIRREL MONKEYS are little quick-moving animals with a sprightly countenance, and not unlike the squirrels in character and size, as their name implies. They have the brain well developed, and are remarkably intelligent. Nocturnal, like the preceding, they live nearly in the same fashion, loving to seclude themselves in coppices and in well-wooded localities; they even occasionally inhabit holes in rocks. They are carnivorous, for they eagerly pursue not only small birds, but also certain species of Mammals. Guiana and Brazil are their native countries.

"Its physiognomy is that of a child; it has the same expression of innocence, sometimes the same sly smile, and always the same rapidity of transition from joy to sorrow; it feels disappointment very acutely,

and testifies it by crying. Its eyes become bedewed with tears when it is vexed or frightened. It is prized by the natives for its beauty, its amiable manners, and the gentleness of its disposition. Its activity is astonishing, though its movements are always full of grace. It is incessantly occupied in play, jumping, and catching insects, especially spiders, which it prefers to all kinds of food."

Humboldt informs us that the Saimiri listens with the greatest attention to people who ask it questions, and that it even stretches out its hands toward their lips, as if to catch the words that escape from them.

How many species there are is still disputed by naturalists. Wallace mentions *three*.

The DEATH'S HEAD Ape as it is called, *Saimiris sciureus*, has a slender form and beautiful colors. It lives in Guiana, in large companies like the Capucins, and is widely diffused. All its habits are graceful; it climbs with great activity, balancing or steering itself by its tail. Its hair is a reddish-black, sprinkled with gray on the limbs; in some varieties the head is coal-black, the body a greenish-yellow, and the limbs golden-yellow. It must have derived its name "Death's Head" from some very superficial observer, although the gray face, with its large eyes and jet-black muzzle, is startling enough.

X.—GENUS CALLITHRIX.

A slender body, slender limbs, a very long thin tail, a round head with a beardless face and short muzzle, bright eyes, large ears, and five-fingered hands and feet characterize the pretty creatures which form this genus. The generic title is derived from two Greek words, *callos* beauty, and *thrix* hair, and is expressive of the beauty of their fur. The common name for the animal is Tee-tee. The number of species is *eleven*.

They live in small bands in the South American forests, and are noticeable for their loud voice, which almost equals that of the Howlers in carrying power. They are shy and timid in freedom, while in captivity they are engaging, intelligent, and affectionate.

The TEE-TEE, *Callithrix personata*, (Plate III, Squirrel Monkey.) This species is of a brownish-black color from the breast upward to the middle of the skull: the back of the head and of the neck are yellowish-white, the rest of the body of a pale dull gray-brown. The hands and

feet are black, the tail of a reddish-brown. In the female these colors are fainter, and the white tint on the neck is wanting. The whole length of the animal, including the tail, is about thirty inches.

The COLLARED TEE-TEE, *Callithrix lugens* or *torquata*, is a beautiful little creature distinguished by much brighter colors. It has fine, shining, beautiful black hair; the face is nearly white, the ear small, well-shaped and almost hairless. In front of the neck is a white collar, nearly as broad as one's hand; the feet are black, the hands white on the upper surface. Its temper is most amiable, its eyes are bright and lively, and all its actions are graceful and tender. It never seems to allow its evil passions to rise, except when it sees a small bird, on which it then pounces like a cat. It is a native of the right bank of the Orinoco and is called by the missionaries the Widow Ape.



CHAPTER IX.

THE MARMOSETS.

THE MARMOSETS OR OUISTITIS—THE FAMILY HAPALIDÆ—THE GENUS HAPALE—THE MARIKIVA—
THE GENUS MIDAS OR THE TAMARINS—THE PINCHE—THE SILKY MARMOSET—THE SAGOUIN
—THE DWARF MARMOSET.

THE HAPALIDÆ or MARMOSETS are very small monkeys, which differ from the true CEBIDÆ as well as from the Old World Monkeys. The thumb is not at all opposable, and all the fingers are armed with sharp claws. The great toe is very small, the tail long and not prehensile. The *two* genera, HAPALE containing *nine* species, and MIDAS, *twenty-four* species, are pronounced by Wallace as of doubtful value. They are both confined to the tropical forests of South America, near the equator.

Some naturalists regard these animals as mere genera of the preceding division; others refuse them a place in the tribe of monkeys; it is, however, most convenient to treat them as a family of the Quadrumana, and as constituting an intermediate link between the Apes and the Lemurs.

The distinctions between the families previously described and the present are striking and important. A Greek name, signifying "Bear Apes," is sometimes given to the Marmosets, not because they resemble bears, but because they have claws in the place of nails, thus approximating to the Carnivora. They differ from the other apes of the New World in their dental formula, for they possess a set of thirty-two teeth, the canines being very large and strong. The head is round, the face flat, the brow flat and broad. The eyes are small, the ears large and often tufted, the body slender, the limbs short. They are chiefly found in Brazil, Guiana, and Peru; two species occur in Mexico.



SPECTRUM TARSIER
SAKI
MARMOSET

SLOW LEMUR
HOWLING MONKEY
SQUIRREL MONKEY

AYE AYE

PLATE III. QUADRUMANA.

They prefer to live in the densest parts of the forests, where they run up and down the trees and along the branches more like squirrels than apes, often suspending themselves by their claws. Their food is insects, fruits, eggs, and small birds. Their chief enemies are the birds of prey. When disturbed they utter a feeble cry from which they derive their name of OUISTITIS.

"Audouin," writes Isidore Geoffroy Saint-Hilaire, "has assured himself, by experiments several times repeated, that these monkeys were well able to recognize in a picture not only their own likeness, but that of another animal. Thus, the drawing of a cat, and, what is yet still more remarkable, that of a wasp, caused them manifest dread; while at the sight of any other insect, such as a grasshopper or a May-bug, they threw themselves on the picture as if to seize the object represented.

"Audouin has also remarked that the Ouistitis were very curious; that they had acute vision; that they perfectly recognized the people who looked after them; and, lastly, that their cries varied considerably, according to the passions that animated them."

Another observer writes: "Their graceful tricks were always amusing, as they never were mischievous. With my cats and parrots they were on terms of the greatest intimacy, sharing, of their own accord, their food with the latter. They soon learned to drink wine, and, after a short experience, exhibited so marked a liking for the juice of the grape, that, if permitted, they would indulge till perfectly intoxicated. Nothing alarmed them so much as the appearance of a snake, and several times, for the sake of experiment, I had one brought into my residence to observe the effect. On seeing their enemy, instantaneously they became powerless, and the woe-begone expression of their countenance for the time being was the perfect personification of utter helplessness; and even after the object of their dread had been removed, it required the lapse of many hours before they recovered their vivacity."

At present, about thirty-three species of Marmosets are known, grouped into two genera, on very slight foundations.

I.—GENUS HAPALE.

This genus has the face and ears bare, a tail as long as the body, thin and tufted at the end, and a mane of greater or less length. The number of species is *nine*.

The LEONCITO MARMOSET, *Hapale leonina*, was discovered by the great traveler Humboldt on the warm plains which border the eastern slopes of the Cordilleras. He says: "It is one of the most beautiful creatures I ever saw—lively, merry, and playful, but like all little animals passionate and spiteful. When angry the neck swells, the mane bristles up and it looks like a lion in miniature." Bates saw a very tame one on the upper Amazon and relates: "It ran to my chair, climbed up to my shoulder, turned about to look into my face, showing its little teeth, and squeaking as if asking my will." This species attains a length of eight inches in the body, and about the same in the tail.

The next species differs from the others by having tufts of hair more or less developed before and above the ears.

The MARMOSET, OUISTITI, or SAGOUIN, *Hapale Iacchus* (Plate III), the commonest member of this group, has a body nine to ten inches long, and a tail twelve to fourteen inches. The color of its long silky fur is black, white, and reddish-yellow. The tail is black, with about twenty small white rings around it and a white tip.

The PINCHE, *Hapale Œdipus*, has long hair on the top of its head, which hangs down over the forehead and neck, but the sides are bare. Specimens have been found to measure twenty-eight inches, including sixteen inches of tail.

The Pinche is remarkable for the tuft of white and long hair which it bears on its head, and which is so distinctly marked that the little creature almost seems to be wearing an artificial head of hair. The throat, chest, abdomen, and arms, are also white, and the edges of the thighs are touched with the same tint. On each shoulder there is a patch of reddish-chestnut, fading imperceptibly into the white fur of the chest, and the grayish-brown hair that covers the remainder of the body. Its eyes are quite black.

The tail of the animal is long and moderately full; its color slightly changes from chestnut-brown to brownish-black. Its voice is like the twittering of birds. Unfortunately this pretty creature cannot endure captivity, and soon dies.

To the same group belongs the smallest of all the apes, a little creature which measures at the utmost only twelve inches, including fully six inches of tail. Its fur is yellow and black, its paws reddish-yellow. Dark bands run from the back over the sides and thighs. The tail has slight rings. Spix discovered this dwarf species at Tabatinga, on the

banks of the Solimoen river, in Brazil; Bates saw it near San Pablo, and remarks that on his return to England he was surprised to see a specimen in the British Museum, described as coming from Mexico. The scientific name of this specimen is *HAPALE PYGMÆA*.

II.—GENUS MIDAS.

The members of this genus are distinguished from the genus *Hapale* by the circumstance that the mane is less developed, and that the tail is longer. The number of species is *twenty-four*.

The MARIKINA, *Midas rosalia*, is larger than the animals just described; the face is bare and brown; the ear large and fringed with dark-brown hair; on the cheeks and on the pointed brow fine, short, yellowish hair stands out; the long hair of the head, divided in the middle by a streak of short brown hair, falls down like a mane, and has a dark-brown color, while the rest of the head, the throat, the breast, and the arms are dark orange-brown; the remainder of the body is covered with a reddish-yellow fur which glistens like gold. This fur is smooth and silky to the touch, and the creature is hence sometimes designated as the "SILKY MONKEY." It is very fastidious about having its beautiful coat kept carefully clean, and soon dies if neglected. It is very timid, has a soft and gentle voice when pleased, but hisses when angry. It is described by Buffon under the name of "Marikina."

The SILVER SAGOUIN, *Midas argentatus*, is one of the rarest of the American apes, and, according to Bates, is found only in Cameta, a province of Brazil. It is the most beautiful of all; the long silky hair is silver-white, the tail dull-black, the almost bare face flesh-colored. It reaches the length of only eighteen inches, including ten inches of tail. Many naturalists regard it merely as a variety of the common Midas.

The TAMARIN, *Midas ursulus*, has a pleasing expression, and a face of considerable intelligence. It is black, but the hinder part is mottled with grayish-white. Bates says it never congregates into large flocks, seldom more than three or four being seen together. Like the squirrel it confines itself to the large boughs of trees, whence it peers down on the traveler. It seems, however, to have no fear of man.

The Marmosets do not seem to be possessed of a very large share of intelligence, but yet are engaging little creatures if kindly treated.

They are very fond of flies and other insects, and will often take a fly from the hand of the visitor. One of these animals with whom Wood struck up an acquaintance, took great pleasure in making him catch flies for its use, and taking them daintily out of his hand. When it saw his hand sweep over a doomed fly, the bright eyes sparkled with eager anticipation; and when he approached the cage, the little creature thrust its paw through the bars as far as the wires would permit, and opened and closed the tiny fingers with restless impatience. It then insinuated its hand among his closed fingers, and never failed to find and to capture the imprisoned fly.

The Marmoset has a strange liking for hair, and is fond of playing with the locks of its owner. One of these little creatures, which was the property of a gentleman adorned with a large bushy beard, was wont to creep to its master's face, and to nestle among the thick masses of beard which decorated his chin. Another Marmoset, which belonged to a lady, and which was liable to the little petulances of its race, used to vent its anger by nibbling the end of her ringlets. If the hair were bound round her head, the curious little animal would draw a tress down and bite its extremity, as if it were trying to eat the hair by degrees. The same individual was possessed of an accomplishment which is almost unknown among these little monkeys, namely, standing on its head.

Another chapter will complete our account of the Quadrumanous animals, with a description of the half-apes or LEMURS.



CHAPTER X.

THE LEMUROIDEA.

THE INDRIS—THE LEMURS—THE RUFFED LEMUR—THE CAT LEMUR—THE HAPALEMUR—THE CHEIROGALEUS—THE LORIS—THE TARSIER SPECTRE—THE AYE-AYE.

WE now have arrived at the second division of the order Quadrumana, and have to describe the very peculiar animals to which Linnæus, the father of Natural History, gave the name of Lemur. The Romans called by this appellation the spirits of the departed, and the restless ghosts that wandered about during the still hours of the night, and the naturalist applied it to these nocturnal animals, which seem indeed to be the ghosts of departed creations. They are the last surviving remains of a race which was once widely diffused; fossil specimens of numerous forms of LEMUROIDEA occur in various parts of Europe and North America, but the living specimens are found in Madagascar, Ceylon, and the islands of Sumatra, Borneo, the Philippines, and Celebes, with some scattered genera in the African continent. To explain the occurrence of these strange animals at points so remote, Mr. Selater has supposed that a continent, now submerged, once extended from Madagascar to Ceylon and Sumatra, in which the Lemuroid type of animals was developed. To this hypothetical continent he gave the name of Lemuria, and it probably represents a zoological region in some long past geological epoch.

Older writers have classed the Lemurs with the Apes, and called them Prosimii, "Half-apes" or "False Apes," but their structure is different from that of the true Simians, and their dental arrangements peculiarly so. It is advisable therefore to keep them apart in a sub-order.

The Lemuroidea live in forest lands where fruit and insects furnish them with food; they are nocturnal in their habits, and during the day retire to the darkest part of the forests where they coil themselves up

and sleep; they are dead in the day, their life begins with the twilight. They are divided into three families, the first of which, the Lemuridæ, contains *eleven* genera, the others only *one* genus each.

THE LEMURIDÆ.

The animals of this family are characterized by an elongated head, analogous to that of certain carnivorous animals, from whence the name of Fox-headed Monkeys which some of the species have received; by opposable thumbs on the four extremities, and especially by the nail on the index finger of the hind-feet, which is long, compressed, and sharp, and singularly contrasts with those on the other digits. Although their brain is but little developed, they have considerable intelligence, and are susceptible of training. They are in general of small size, and furnished with a short or long tail, though some species are deprived of that appendage. Their eyes are very salient, as befits their nocturnal mode of life.

At the approach of twilight they rouse themselves, smooth their fur, utter their unpleasant cries and begin their nightly quest for food. The cry of some of the species is alarming, as it resembles the roar of a beast of prey. In hunting for food, they equal or even surpass the apes in agility in climbing; they seem to have wings, so powerful are their springs from bough to bough, so swift their ascent or descent of the tree-trunks, so restless their ever-changing motions. They eat much, they destroy more.

I.—GENUS INDRIS.

INDRIS is the name given to this genus by the traveler Sonnerat, and the word is said to be in the Malagasay language not the name of an animal, but an exclamation "See here! Look!" which the stranger misapprehended. The natives of Madagascar call the Indris the "Man of the Woods," because of its resemblance, though slight, to ourselves. It is the most highly developed of the family. The head is small, the fore-limbs not much shorter than the hind-ones, and its powerful thumbs, perfectly opposable on all feet to the remaining fingers, are admirable instruments for climbing. The tail is short, the eyes small, the ears hidden in the fur. This fur—thick, almost woolly—covers the

whole body, even the fingers and toes down to the nails. Its dental formula is

$$I. \frac{2-2}{1-1}, C. \frac{1-1}{1-1}, P. \frac{2-2}{2-2}, M. \frac{3-3}{3-3} = 30.$$

The genus contains *five* species, all natives of Madagascar.

THE BABAKOTO.

The BABAKOTO, *Indris brevicaudatus*, was for a long time the only known species. It attains a length of nearly three feet, including eight and a half inches of tail. Its almost hairless face is of a brownish-black color. The head, including the ears, shoulders, arms and hands, are black, the back is brown, the forehead, temples, throat, breast, tail and flanks are white. The creature is so little known that it is not yet ascertained whether these colors change at various ages, or whether they belong to both sexes.

The CROWNED INDRIS, *Indris mitratus*,—perhaps merely a variety—is somewhat smaller; the hair is more silky and the coloring of extraordinary beauty. The naked black muzzle and the cheeks thinly covered with gray hairs are set in a broad, gray, black-bordered frame which running down each side of the face unites at the throat, and joins a spot of dazzling white which dies away on the neck into grayish-white streaks. The ears, shoulders, upper part of the back, and the breast are black; a triangular patch, beginning at the lower part of the back and gradually broadening to the rump, is white; the tail is a reddish cream-color, the feet are light gray.

Sonnerat describes the Babakoto as active and a good leaper; it eats like a squirrel, holding its foot up to its mouth. Vinson, during his passage through the great Alanamasoatrao forest, was almost deafened by its cries, and inferred that it must collect into large bands. The natives reverence it as a holy animal, and believe the souls of their ancestors pass into it at death; hence they consider that the trees on which the Babakoto lives is an infallible cure for all diseases, and use its leaves as a remedy in dangerous cases. They say too that it is dangerous to hurl a lance at it, as the Indris can catch the spear in its flight and hurl it back on the aggressor, and that the mother after birth throws her young one to the male who throws it back again, and when this has been repeated

a dozen times without accident, the little one is taken up and carefully nursed. If, however, it fall to the ground it is left lying.

Pollen says that in certain parts of Madagascar it is trained to catch birds. But these seem "travelers' tales"; the latter seems especially improbable, for if the Indris had been thus tamed, living specimens could have been procured.

II.—GENUS LEMUR.

The name MAKI by which the natives of Madagascar designate this genus is said to be an imitation of the cry it utters. These animals are, of all the Lemuridæ, those whose heads are the most tapering; and therefore it is to them that the denomination of Fox-headed Monkeys is applicable. Buffon called them False-Monkeys. They stand somewhat high on their feet, and take rank, for size, between the Marten and the Fox. Their fur is soft and thick, and their tail long and bushy. They live in forests, and feed chiefly on fruits. Their movements are light and graceful; their voice is a low or a loud growl, according to the nature of their emotions. The female has only one at a birth, and testifies the greatest tenderness for it, keeping it concealed beneath her body, buried in her thick fur, until the period when its hair, having acquired a sufficient length, may efficaciously protect it against external vicissitudes. It is suckled for six months, after which it is left to its own resources.

These animals are sociable, and often collect into numerous bands. They select almost inaccessible places to sleep in; are readily tamed, and even reproduce in captivity. Their dental formula is

$$I. \frac{2-2}{2-2}, C. \frac{1-1}{1-1}, P. \frac{3-3}{3-3}, M. \frac{3-3}{3-3} = 36.$$

The number of species is *fifteen*.

Pollen gives a description of the habits of one species, the MAYOTTE, which will serve for them all. They live in bands of six to twelve, and travel about in search of their favorite food, the fruit of the Date palm: they are seen by day descending from trees to pick up fallen fruit. No sooner has the sun set than the whole band set up their lamentable cry. When chased by dogs they take refuge in a tree, where they remain with their eyes fixed on their enemy, moving their tails to and fro, and growling. If wounded they defend themselves stoutly, leaping on the dog's

back and biting the ears and neck. The flesh, somewhat resembling that of a rabbit in taste, is considered a great delicacy by the natives.

They endure captivity well. Buffon had a male Maki which was quite tame and a great thief. It used to lick his hand; but if its tongue, rough like a cat's, drew blood, it bit savagely. Another specimen lived in Paris a long time. It was very fond of warmth, and used to go so near the flame as to singe its whiskers; it was cleanly, and careful not to soil its fur, and was very curious and greedy, but kindly to all comers. Every evening it hopped or danced for about half an hour, and then lay down to sleep.

THE RUFFED AND THE BLACK-FRONTED LEMURS.

The RUFFED LEMUR, *Lemur varius*, is one of the largest species of the family, equaling in size a moderately grown cat.

The texture of the fur is extremely fine, and its color presents bold contrasts between pure white and a jetty blackness, the line of demarcation being strongly defined. The visage is black, and a fringe of long white hairs stands out like a ruff round the face, giving to the creature its very appropriate title. Its voice is a deep sepulchral roar, peculiarly loud considering the size of the animal, which can be heard at a great distance.

The ATUMBA or BLACK-FRONTED LEMUR, *Lemur macaco*, and the WHITE-FRONTED LEMUR, *Lemur leucomystax*, are sometimes classed as different species, but Brehm, who has studied them both in captivity, asserts they belong to one and the same species. He says that all the Black-fronted Lemurs he has seen are males, all the White-fronted are females, and that reports from the zoological gardens in London, Cologne, and Rotterdam, and from friends in Zanzibar, state that their experience is the same. A female under his charge brought forth a young one, which showed no sign of blending of color, such as hybrids usually do.

It is a gentle and engaging creature, and not at all shy, even to strangers, unless they alarm it by loud voices or hasty gestures. It is possessed of great agility, climbing trees, and running among the branches with perfect ease, and capable of springing through a space of several yards. So gently does it alight on the ground after its leaps, that the sound of its feet can scarcely be heard, nor can the eye follow its motions. When pursued, it displays incredible activity; it will

suddenly drop from the top of a tree to the underwood and run away before the hunter can realize the fact.

THE MONGOOSE AND THE RING-TAILED LEMUR.

The MONGOOSE, *Lemur mongoz*, is one of the commonest varieties; it measures about three feet, including a foot and a half of tail. The color, dark ash-gray on the back, becomes a grayish-black on the head; a white streak runs from beneath the neck up to the ears; the lower part of the back is light-brown.

The RING-TAILED or CAT LEMUR, *Lemur catta*, is not as large as the *Ruffed Lemur*, measuring only a foot from nose to tail, the tail being eight inches in length. The grace of its form, the beauty of its color, its large eyes, and its long ringed tail, render it one of the most beautiful of the species. It is found only in the Southwest of Madagascar, and lives like its congeners. Its cry, however, is not loud, but resembles the mew-ing of our "harmless, necessary cat." In confinement it becomes familiar, and when it chooses to exhibit its powers, is very amusing with its merry pranks. If several individuals are confined in the same cage, they are fond of huddling together, and involving themselves in such a strange entanglement of tails, limbs, and heads, that until they separate, it is almost impossible to decide upon the number of the animals that form the variegated mass.

The quartermaster of a French corvette possessed one which recognized its master among all the crew; it loved to play with the boys and the ship's dog. It nursed a little monkey as if it had been its own child, and amused itself by pulling the tails of the chickens till they screamed.

The RED LEMUR, *Lemur ruber*, possesses a fur which has somewhat of a woolly aspect, the hair separating into tufts, each of which is slightly curled. It is a beautifully decorated animal, displaying considerable contrast of coloring. The body, head, and the greater portion of the limbs, are of a fine chestnut, with the exception of a large white patch covering the back of the head and nape of the neck, and a smaller one in the midst of each foot. The face, the tail, and paws, are black, as is all the under side of the body. This latter circumstance is most remarkable, as it is almost a general rule that the under parts of animals are lighter in tint than the upper. Around the sides of the face the hair is of a paler chestnut than that which covers the body.

In habits it is similar to the Lemurs which have already been described. Being naturally a nocturnal animal, it passes the day in a drowsy somnolence, its head pushed between its legs, and the long, bushy tail wrapped round its body, as if to exclude the light and retain the heat. Should it be accustomed to be fed during the daytime, it shakes off its slumber for the purpose of satisfying the calls of hunger; but even though urged by so strong an inducement, it awakes with lingering reluctance, and sinks to sleep again as soon as the demands of its appetite are satisfied. Its entire length is nearly three feet, of which the tail occupies about twenty inches. Its height is about a foot.

III.—GENUS HAPALEMUR.

This genus, containing *two* species, is distinguished by a slender body and short limbs, but a tail as long as itself. The head is round and sharp-muzzled, the eyes small, the ears broad and short and hidden in the fur.

The GRAY LEMUR, *Hapalemur griseus*, called by the natives of the Northwest of Madagascar the BOKAMBUL, chooses for its abode thickets of bamboo. During the day it sleeps on the highest shoots, with its head between its legs and its tail over its back. Like all the tribe, it is lazy during the daytime but busy at night; its cry is like that of a pig grunting. Pollen had a captive which differed in no wise from other Lemurs; he remarks that, like some apes, it acquired the bad habit of gnawing its own tail.

IV.—GENUS MICROCEBUS.

The DWARF MAKIS have a compact form, a short head, a roundish muzzle, a tail longer than the body, and the hind limbs not longer than the fore ones. The eyes are large, the ears moderate, thinly covered externally with fine hair, pretty hands and feet, with short fingers but long *tarsi*. The dental formula is

$$I. \frac{2}{2} - \frac{2}{2}, \quad C. \frac{1-1}{1-1}, \quad M. \frac{6-6}{5-5} = 34.$$

Of the *four* species into which the genus is divided, the best known is the *Microcebus myoxinus*, which attains a length of six to eight inches

in the body. The back is a reddish yellowish-gray, with a golden lustre; the lower surface is white. We know very little of it, as its diminutive size and nocturnal habits enable it easily to escape observation. It lives in almost impassable forests, hiding itself during the day in a nest which it builds of straw and dry leaves; at night it roams like its fellows in quest of food, chiefly insects.

V.—GENUS CHEIROGALEUS.

This genus, like the preceding one, is remarkable for the greater roundness of the head, the shortness of the muzzle, and the great size of its eyes; the latter peculiarity indicating more decided nocturnal habits. It contains *five* species. The best known is the *Cheirogaleus Milli*, which measures nearly fourteen inches exclusive of the tail; the fur is tawny on the upper surface of the body, but white beneath. Its legs are very short when compared with the ordinary Lemur. A specimen in captivity made a nest for itself out of hay, in which it slept during the daytime. During the night its movements were ceaseless; it could leap a height of six or eight feet.

One of the species, the *Cheirogaleus murinus* or MADAGASCAR RAT, is the smallest of all the Lemuridæ, its body measuring only six inches in length.

VI.—GENUS LEPILEMUR.

Only *two* species are known. It has a slender body, a small, long, sharp-snouted head, short fore-limbs, moderately long hinder-limbs, and a tail longer than the body. The eyes are of moderate size, the ears large and bare; the white fur which thinly covers the face and hands, and is largely developed on the tail, is rather woolly.

THE WALAWY.

The WALAWY, *Lepilemur fuscifer*, is nearly as large as the *Hapalemur*. A brownish-gray is the dominant tint on the back, a sharply marked-off light-gray on the belly; the head and neck incline to red, black stripes beginning on the cheeks, inclosing the eyes, and leaving a blaze on the forehead, unite on the head, and run down the spine to the tail; this

appendage, gray at the roots, is black at the tip. The eyes have the iris black.

Both species are found on the West side of Madagascar. The animals prefer as their abodes hollow trees with two openings, especially if also inhabited by bees. They are much more active than the ordinary Lemur, and their cry is a "kaka kaka ka."

The curious animal, which is known by the name of the DIADEM LEMUR, belongs rather to the Indris than to the Lemurs, but it has been placed by Mr. Bennett in a separate genus, which he names *PROPTHECUS*. The shoulders and upper part of the back are of a sooty tint, the head darker, the hindquarters pale-brown, the belly nearly white, the paws almost black, the tail nearly white at the tip. The thumbs of the hindlimbs are disproportionately developed, and the face is not so long as in the true Lemurs; the round, tipped ears are hidden in bushy hair, which surrounds the head. The species described is called the *Propithecus diadema*, and seems to be the same as the *Indris* (or *Lechanotus*) *mitratus*.

The species of the *Lemuride* already mentioned belong exclusively to that strange African Island, Madagascar. The next sub-family, the *Nycticebinæ*, have a more extensive range.

VII.—GENUS NYCTICEBUS.

The SLOW LEMURS (Plate III) are found from East Bengal to China, Borneo, and Java. Three species are known. These rare denizens of the forests have not been much observed in their life of freedom, but they have been repeatedly brought to Europe. They creep very slowly, and seldom take more than two steps erect; even in climbing, their slowness is remarkable. By day their eyes lose their lustre, but they see admirably by night. Their hearing is very acute; the slightest motion of a beetle wakens them from their sleep.

THE KAKANG.

The SLOW-PACED LEMUR, *Nycticebus tardigradus*, called by the natives the KAKANG, has a fur of a woolly texture, and of a chestnut tinge. A dark stripe surrounds the eyes, ears, and back of the head, reaching to the corners of the mouth, and running thence along the entire length

of the spine. The color of this dark band is a deep chestnut. The animal is a little more than a foot in length.

In the formation of these creatures some very curious structures are found, among which is the singular grouping of arteries and veins in the limbs.

Instead of the usual tree-like mode in which the limbs of most animals are supplied with blood—one large trunk-vessel entering the limb, and then branching off into numerous subdivisions—the limbs are furnished with blood upon a strangely modified system. The arteries and veins, as they enter and leave the limb, are suddenly divided into a great number of cylindrical vessels, lying close to each other for some distance, and giving off their tubes to the different parts of the limb. It is possible that to this formation may be owing the power of silent movement and slow patience which has been mentioned as the property of these lemurs, for a very similar structure is found to exist in the sloth.

The tongue is aided in its task by a plate of cartilage, by which it is supported, and which is, indeed, an enlargement of the tendinous band that is found under the root of the tongue. It is much thicker at its base than at the extremity, which is so deeply notched that it seems to have been slit with a knife. It is so conspicuous an organ that it has been often described as a second tongue. The throat and vocal organs seem to be but little developed, as is consistent with the habits of an animal whose very subsistence depends upon its silence. Excepting when irritated, it seldom or never utters a sound; and even then, its vocal powers seem to be limited to a little monotonous plaintive cry.

All its motions are exceedingly slow, but it possesses one skillful faculty which no other animal exhibits: it can climb slowly step by step backward up a pole placed nearly perpendicularly.

VIII.—GENUS LORIS.

There is only *one* species of this small, tailless, nocturnal Lemur, which inhabits Madras, Malabar, and Ceylon. It is called the BENGAL LORI, *Loris gracilis*. In Ceylon the natives call it Teivangu, or “the creeper.” The best account of it is given in Tennant’s work on Ceylon. “I possessed a living Teivangu which lived for some time; it ate rice, fruits, and leaves, but preferred ants and insects. It was very greedy for

milk and the flesh of birds. It can catch birds more easily than one would suppose from its appearance. The natives affirm that at night it will attack peacocks, choke them, and then suck the brains of its prey. My prisoner slept all day in a most peculiar attitude. He seized his perch with all his hands, gathered himself up into a hairy ball, and hid his head between his legs. The large and brilliant eyes of the Loris have attracted the attention of the Cingalese; they make amulets and love-charms from them, and hold the poor creature in the fire till its eyeballs burst."

The Loris is a small animal, measuring only nine inches in length; its limbs are very slender, the muzzle is abruptly sharp and pointed, the color is a rusty-gray, somewhat darker round the eyes, and a white streak runs down the nose. The absence of a tail is strikingly noticeable.

Wood gives an animated description of the mode in which it captures its prey. "The color of its fur is such that the dark back is invisible in the obscurity of night, and the white breast simulates the falling of a broken moonbeam on the bark of a branch. Its movements are so slow and silent that not a sound falls on the ear.

"Alas for the doomed bird that has attracted the fiery eyes of the Loris! No Indian on his war-path moves with stealthier step or more deadly purpose than the Loris on its progress toward its sleeping prey. With movements as imperceptible and as silent as the shadow on the dial, paw after paw is lifted from its hold, advanced a step and placed again on the bough, until the destroyer stands by the side of the unconscious victim. Then, the hand is raised with equal silence, until the fingers overhang the bird and nearly touch it. Suddenly the slow caution is exchanged for lightning speed, and with a movement so rapid that the eye can hardly follow it, the bird is torn from its perch, and almost before its eyes are opened from slumber, they are closed forever in death."

IX.—GENUS PERODICTICUS.

This is another genus containing only *one* species, the POTTO, *Perodicticus Potto*, a small Lemur with almost rudimentary forefinger found at Sierra Leone on the West Coast of Africa. The Potto has a slender body, roundish head, projecting muzzle, moderately large eyes and small ears; the arms and legs are nearly of the same length, the hands and feet large. The short fur is of a reddish-gray mixed with black, redder on

the head and limbs, mouse-color on the shoulders, and a grayish-red on the tail; its total length is about fourteen inches, the tail being about three inches.

Mr. Selater writes of two specimens in the Zoological Gardens in London: "Our Pottos never voluntarily appear by daylight, but come out early in the evening for their food; they are then very active and leap about the perches of their cage all night long. Their food is ripe fruit of all kinds, cooked rice, milk and bread sweetened, and cooked meat chopped fine. They catch very cleverly little birds that are put in their cage, and tear them to pieces at once; they seem to be delighted with such a change of diet."

X.—GENUS ARCTOCEBUS.

The ANGWANTIBO, *Arctocebus Calabarensis*, the only species, is a native of Old Calabar. It is remarkable for the total absence of the forefinger, for the possession of a long claw on the first toe, and for an almost rudimentary tail. A thick and long woolly fur—somewhat shorter on the face and the backs of the paws—covers the body. It is of a brownish-gray on the back, but on the lower surface of the body and on the inner side of the limbs it is dark-brown.

Although the Angwantibo has been known since the year 1680, little has been ascertained respecting its habits.

XI.—GENUS GALAGO.

This solitary genus of the sub-family GALAGINÆ comprehends *fourteen* species, all found in Africa from Senegal to Zanzibar and Natal. While the Lemuridæ hitherto described are remarkable for the development of the power of sight, the Galagos are distinguished by the acuteness of their hearing. The body is slender, but looks stouter from its possession of a thick fur; the comparatively large head is remarkable for the largely developed naked ears, and by the close-placed large eyes. The limbs are of moderate length, the forefinger, the second toe, and in some species the middle finger and toe as well, are furnished with claw-like nails. The tarsus is elongated, the tail bushy. The dental formula is

$$\text{I. } \frac{2-2}{3-3}, \text{ C. } \frac{1-1}{1-1}, \text{ P. M. } \frac{3-3}{2-2}, \text{ M. } \frac{6-6}{3-3} = 42.$$

The Galagos are strictly nocturnal animals, creatures whose sun is the moon; during the day they lie rolled up in a shady corner, and if by chance they are prevented from finding a spot obscure enough, they hide their head from the hated sunlight, and contract their ears to deaden every sound. If violently awakened from their sleep they stare dreamily about them, and exhibit signs of annoyance at having been disturbed. As soon as twilight spreads over the forest they rouse themselves, open their eyes, unroll their huge ears, and leave their lurking-places. Their life is that of a beast of prey with an insatiable thirst for blood, and a love for slaughter unexampled in the Quadrumana. Endowed with eyes as sharp as the lynx, ears as acute as the bat, with powers of scent like the fox, and the agility of the monkey, they are persevering in their attacks, and a terrible foe to smaller creatures.

THE MOHOLI AND THE KOMBA.

This species—*Galago Moholi*, (or *Otolicnus*)—attains a length of eight inches in the body and ten inches in the tail. Its short, thick, silky-fur is dull gray, with a faint tinge of red on the head and back; the belly and inside of the limbs is yellowish-white, and the same color appears on the cheeks and a stripe running down between the eyes to the end of the nose. It has been found in Senegal and eastward in Kordofan. The natives call it *Tendj*, and say that it is an ape transformed to a lower shape on account of its sleepiness. It is usually found in pairs, and lives in the forests of mimosa. Startled by the traveler the creatures climb quickly up the trees but do not take flight; they remain there quietly watching and listening. They make long springs from bough to bough and seem not to regard the stiff prickles of the tree. By night their eyes gleam like burning coals. In captivity they display great liveliness. When they go to sleep the ears wrinkle and contract, and then the point turns over and in, till the whole ear is almost invisible. They can contract the face into strange grimaces like some of the apes.

The *Galago agisymbanus* is somewhat larger, attaining a length of from eight to twelve inches. The prevailing color is yellowish-gray, darker on the muzzle and the hands, becoming a grayish-white on the chin and cheeks. The tail, a brownish-red at the roots, is dark-brown at the tip.

The natives of Senegal capture these animals by taking advantage of their fondness of palm-wine; its sweetness attracts them, the spirit in

it intoxicates them, and the little lemur falls down from the tree and lies in a drunken sleep, to awake a prisoner. It is not difficult to tame, and soon learns to eat bread and milk, and to appreciate tea and coffee, well sweetened. But flesh is always its favorite food, and it displays immense energy in hunting mice. If its master visit it at night, it shows great attachment, and allows himself to be handled and stroked.

THE GIANT GALAGO.

The *Galago crassicaudatus* is the largest species, being nearly the size of a rabbit. Its hair is thick and woolly, its tail bushy. The top of the head is reddish-brown, the back grayish-russet, the belly gray or yellowish-white, the tail a brownish-red.

It extends over a large part of Southern Africa on the Mozambique coast. Its habits differ in no respect from those of its kindred. It sleeps all day, and is active all night. It sleeps rolled up with its head between its fore-legs, its bushy tail is then brought forward and kept in its position by the hind-legs, which are stretched out as far to the front as they will extend. The head is thus entirely covered. On waking it cleans its coat, and then begins to climb. Its movements are slow and careful, its steps quite inaudible, the fingers are spread out widely, the tail trails on the ground. It casts hungry glances at living birds, but in captivity will eat bread or fruits, which it sometimes takes squirrel-fashion in its hands. It is good-tempered and has a sagacious look in its pretty brown eyes.

THE TARSIIDÆ.

This family is represented by only *one* genus which contains but *one* species. It derives its name from the great length of the hinder feet, in which the tarsus is elongated. The tail is very long and possesses a tuft at the tip. Its dental formula is that of the genus Lemur, but the lower incisors are oblique.

THE SPECTRE TARSIER.

This most extraordinary-looking animal, the *Tarsius spectrum*, (Plate III) is a native of Borneo, the Celebes, the Philippine Islands and Banca. The head would be round if a short muzzle did not protrude; the face is

uncommonly broad, the mouth opens as far back as the eyes, and the lips are thick. The eyes are immense owl-like eyes, quite out of proportion to the size of the animal. They literally occupy the greatest part of the face and are close together. The ears are no less peculiar; they are like large broad spoons. The neck is scarcely to be distinguished, the shoulders are high, the breast narrower than the back. The fore-legs are remarkable for their shortness, the hinder ones for their length. The hands are very long in proportion to the arms, the middle finger is almost thrice the length of the thumb, which again is less than the little finger, and the tips of all the fingers have large cushions like balls. The thighs are powerful and thick, the lower leg thin, the tarsi dried up and fleshless. The color is a yellowish-gray, flecked with reddish-brown, the tuft on the tail is yellow, a stripe of deeper hue surrounds the back of the head, and the face and forehead have a warmer tint than the body. It lives in trees and skips about with short leaps like a frog.

The natives regard the Spectre tarsier as an enchanted animal, and affirm that it was once as large as a lion; they fly at once from their fields when one of these creatures is seen on a neighboring tree. In captivity it is cleanly, particularly in its food; it never tastes anything half-eaten, or drinks twice from the same water. Propped up on its thin legs and bare tail, with its enormous yellow eyes, it looks like a dark-lantern on a tripod.

THE CHEIROMYIDÆ.

This family consists of a species which must be considered the most extraordinary which is known to naturalists. It is a specialized form of the Lemuroid type, and like the Lemurs belongs to that isle of wonders—Madagascar.

THE AYE-AYE.

The AYE-AYE, *Cheiromys Madagascariensis*, (Plate III) was first seen about one hundred years ago. It was unknown at that period to the people of Madagascar, and the name of Aye-Aye given to it by Sonnerat, was due to the exclamation of the natives of that island when this traveler showed it to them for the first time.

For a long time it was undecided what place to assign to the Aye-Aye among the Mammalia. This indecision arose from ambiguous organic

characteristics in this quadruped, some of which pertain to Rodents and others to the Makis. At first sight, the Aye-Aye shows some striking points of resemblance to the Squirrels: it has their general form, the long bushy tail, and especially their dentition. It has, in fact, no canine teeth, but possesses, in front of its jaws, a pair of strong incisors, isolated from the molars by a vacant space, similar to the gap occurring in the Squirrels and all animals belonging to the Order of Rodentia. But, on the other hand, the large size and rounded form of its head, indicative of a voluminous brain, the conformation of its limbs, the length of the digits, and the opposable thumb in the posterior members, the complete state of the bony circle of the orbit, as in the majority of Quadrumana, the existence of only two mammae in the female, are characteristics which assimilate the Aye-Aye to the Makis, and ought definitively to cause it to be ranked in the Quadrumana.

But it may be observed as a marked difference between this animal and all the other Quadrumana, that in the Aye-Aye the milk-giving organs are placed on the lower portion of the abdomen, and thus a great distinction is at once made between this creature and the true Quadrumana. Indeed, there are so many points of discrepancy in this strange being, that it is difficult to make it agree with the systematic laws which have hitherto been laid down, and naturalists have placed it in one order or another, according to the stress which they laid on different points of its organization.

After its discovery in 1782, so little was heard of the Aye-Aye that many writers described it as extinct. But further news of it was heard in 1844, when De Castelle forwarded the skeleton and hide of one to Paris. This remained the only specimen in Europe, till 1862, when the Zoological Society of London received one alive. Since then several of them have been sent to various collections in Europe. From the time of Cuvier down to Giebel in 1839, most writers classed it among the *Rodentia*, but Owens and Peters have clearly established its right to the rank of a family; according to them its dental formula is

$$I. \frac{2-2}{2-2}, C. \frac{1-1}{0-0}, M. \frac{2-2}{2-2} = 18,$$

for its first set of teeth, but for the permanent set

$$I. \frac{2-2}{2-2}, C. \frac{0-0}{0-0}, P. M. \frac{1-1}{0-0}, M. \frac{3-3}{3-3} = 22.$$

The Aye-Aye is characterized by the following marks: The head is large, the neck short, the body powerful, the tail as long as the body. The limbs are of the same length. The eyes are small in comparison with the head, the ears very large. The elongated fingers and toes are remarkable. The thumb is strong and short, the index-finger weaker, the third finger as thick as the thumb, the little finger very strong, while the long middle-finger seems dried up. The forearm is moderately long, the big-toe like the thumb, the other toes all of the same length. The face is of a reddish-gray with dark rings round the eyes and a light patch over them; the gray color continues on the chest and throat; elsewhere the color is a brownish-black sprinkled with white and with gray reflections. The adults reach the length of twenty-seven inches, of which more than half belongs to the tail.

Pollen in 1863 published an account of the creature's habits. "This remarkable beast lives in the bamboo forests of the interior of the island. The natives say it is so rare as to be seen only by accident: it lives alone or in pairs, never in bands, is seen only at night and sleeps by day in the densest thickets. It feeds on the sap of the bamboo and sugar-cane, as well as on beetles and larvae. To get its food, it gnaws, with its strong incisors, an opening into the stem of the plant, and through it inserts its attenuated middle-finger, and brings out the insects or the liquid. At sunset it comes out and searches every opening, cleft or hollow in the trees, but at the approach of dawn hides itself in the thickest recesses. Its cry, a loud grunting, is often heard in the night.

The extraordinary character of the whole of the Lemnroids, and their confinement to the island of Madagascar, has excited much attention. Geologists inform us that remains of Lemnroids have been found in the Eocene deposits in France, while in North America Mr. Marsh recognizes no less than twelve genera of extinct Lemnroids. The European forms are most allied to the West African group, the American to the Marmosets. Hence even in the Tertiary deposits we have not yet got far enough back to find the primeval type from which all the Primates spring.

Mr. Wallace considers that there is evidence for belief that in early Tertiary times a continuous sea from the Bay of Bengal to the British Islands isolated Southern and Central Africa, which continent extended as far as Southern India and Japan. During this period the highest types of Mammalia were absent, and lemurs, edentates and insectivora

took their place. He adds that while there is every reason to negative a union between Africa and America, yet a moderate extension of their shores to each other is not improbable, and this with large islands in the place of the Cape Verd group, St. Paul's Rocks, and Fernando Noronha, would suffice to explain the amount of similarity that actually exists.



ORDER II.

CHEIROPTERA.

I.—FRUGIVORA.

9. PTEROPIDÆ - - - - FRUIT-EATING BATS.

II.—INSECTIVORA.

10. PHYLLOSTOMIDÆ - - - - LEAF-NOSED BATS.
11. RHINOLOPHIDÆ - - - - HORSE-SHOE BATS.
12. VESPERTILIONIDÆ - - - - TRUE BATS.
13. NOCTILIONIDÆ - - - - DOG-HEADED BATS.



CHAPTER I.

THE ORDER OF CHEIROPTERA—SUPERSTITIOUS DREAD OF BATS—THEIR USEFULNESS—THEIR FLYING APPARATUS—THEIR GENERAL CHARACTERISTICS AND HABITS—THE GENERA OF THE ORDER.

WE have hitherto been describing strange creatures which are not native to our country, and of which living specimens are seen by us only as prisoners in the cages of menageries, or as beggars accompanying some itinerant organ-grinder. The order of which we are now about to treat is one of which some of the members are well known to all our readers. In the summer days, as the sun declines, the bats begin to come out from the recesses where they have hidden themselves from the garish light of the sun. As the darkness deepens their numbers increase, and when night has come they are all busy, wheeling in their strange intermittent flight, as they pursue their insect prey. They seem to be half birds and half mammals, and to form a link between these classes. For a long time, indeed, they were regarded as birds. Moses describes them as "fowls that creep, going upon all fours," and adds that they are to be "an abomination." Aristotle defines bats to be birds with wings of skin, and his authority gave currency to this view of their relationship till comparatively modern times. The bats, however, have no other resemblance to birds than that they can fly.

But while philosophers agreed in calling the bats birds, the uneducated classes, who knew nothing of theory and were guided by their own observations, seem everywhere in Europe to have regarded them in their true light, as a form of mammal. The French name them "the bald shrew mouse"; the Spaniards, the "blind mouse"; to the German they are "fledermäuse"; to the English peasant, the "fluttermouse," or the mouse that flits or flutters.

The dark dwellings of the bats, the strange, mouse-like body, the leathern wing, the melancholy squeak, the repulsive look, give to them a mysterious character. While good spirits appear with the wings of a dove, evil demons are, in popular superstition, provided with the wings of the bat; and fabulous creatures like dragons or griffons are supposed to bear themselves through the air on bat-like wings. Such views, instilled in childhood on uneducated people, have produced a hatred against a set of creatures which have claims for our protection, and which certainly do more good than harm, by continuing in the twilight the work of the swallow and keeping down the crowd of insect pests.

The wild superstitions connected with the name of Vampire deserve a longer notice. An eloquent writer has remarked: "Of all the creations of superstition a Vampire is perhaps the most horrible. You are lying in your bed at night, thinking of nothing but sleep, when you see by the faint light that is in your chamber, a shape entering at the door and gliding toward you. The thing moves along the air as if by the mere act of volition; it has a human visage and figure. The eyes stare wildly from the head; the hair is bristling; the flesh is livid; the mouth is bloody.

"When you awake in the morning you think it is all a dream, until you perceive a small, blue, deadly-looking spot on your chest near the heart. You say nothing of the matter, but you know you are a doomed man. Every night the shape returns, and, with a face horrified at itself, sucks your life-blood in your sleep. You pine and droop and languish till you die. When dead you yourself become a Vampire and create fresh victims, who, dying in turn, add to the phantom stock."

This belief that the dead body is sometimes animated by a demon who caused it to rise from the grave and behave like a mosquito, is very prevalent in the Southeast of Europe. Greece seems to have been its cradle, but it is still widely spread and firmly held in the countries bordering on Greece.

From about the year 1727 to 1735 there was an epidemic of Vampirism in Servia and Hungary. People died by hundreds under the belief that they were killed by phantoms. Commissions were appointed to investigate the matter, and the graves of alleged Vampires opened; the bodies were found undecomposed, with fresh skin and nails growing, with florid complexions, and blood in the chest. Voltaire tells us that "Vampires can be brought to reason only by being burnt when they

are caught; but the precaution must be taken not to resort to this measure till the heart has been torn out." An old German writer describes the execution of a Vampire: "When they opened his grave, after he had been long buried, his face was found with a color, and his features made natural movements as if the dead man smiled. He even opened his mouth as if he would inhale air. They held a crucifix before him and called, 'See, this is Jesus Christ, who redeemed your soul from hell.' Upon this tears began to flow from the dead man's eyes. Finally, when they proceeded to hack off his head, the corpse uttered a screech and turned and rolled just as if it had been alive." In fact the superstition caused the murder of a sufferer from trance.

Allusions to the belief are common in Byron:

But first on earth as Vampire sent,
Thy corse shall from its tomb be rent,
Then ghastly haunt thy native place,
And suck the blood of all thy race,
Yet loathe the banquet, which perforce
Must feed thy livid, living corse.

He refers for further particulars to Southey's notes on "Thalaba," and adds that the stories told in Hungary and Greece of these foul feeders are most incredibly attested.

Undoubtedly the application of this name Vampire to the blood-sucking bats of South America has increased the aversion with which all the order is regarded.

The Cheiroptera increase both in number and variety as we approach the tropics. In the torrid zone they come out by thousands. In Central and South America they people the twilight of the primeval forests, they live in hollow trees and in rocks, and wage relentless war on the tribes of insects. The traveler sees them by daylight hanging from the trees, by night they are found in the midst of the forests as well as on the banks of the rivers. In Southern Asia the swarms of bats literally darken the sky when evening comes. "The bats," writes Tennant, "form a decided feature in the evening landscape in Ceylon. They are found in crowds in every hollow, in every underground passage, in the galleries of fortresses, under the roofs of houses, in the ruins of every temple. When night has come and the lamps are lit they appear, flutter around the table, and catch their prey by lamp-light." Nor are they much less

numerous in the South of Europe, where the ruined edifices which abound in Italy, Greece, and Spain, send forth whole armies. They are quite as numerous occasionally in our own country. In a building in Maryland nine thousand six hundred and forty bats by actual count were destroyed by new tenants who entered the house after it had remained for some time unoccupied.

The scientific name given to this peculiar order of creatures is CHEIROPTERA; a word compounded of the Greek word *cheir* "a hand," and *pteron* "a wing," and expressive of the fact that they are mammals with winged hands.

This winged hand deserves our careful notice. All the fingers of the hand, with the exception of the thumb, which is short, has a nail, and is quite free, are immoderately long, and united by means of a transparent membrane, which is without hair. This membrane covers also the arm and fore-arm, and is nothing else than a prolongation of the skin of the flanks. It is composed of two very thin layers, one a continuation of the integuments of the back, the other that of the abdomen. It also extends between the posterior limbs, where it is more or less developed, according to the species, and there takes the name of the interfemoral membrane; but it never reaches the toes of the feet, which are short, and have nails.

It is owing to this membranous sail that Bats direct their course through the air in the same manner as Birds. When they are at rest, they fold their wings around them, enveloping their bodies as if in a mantle, just as we close an umbrella. The short, free thumb takes no part in extending the leathern wings, but it has to supply the place of fore-limbs when the bat is climbing or clinging. The foot has one striking peculiarity; it has a bone which is confined to the Cheiroptera. This spur-bone springs from the heel, and serves to stretch the membrane between the leg and the tail.

The nose in all varieties of the Cheiroptera is highly organized. Not merely are the nostrils well opened, and capable of being closed or distended by peculiar muscles, but many families have in addition most extraordinary nasal appendages.

The ear too is equally complex; it consists of a very large cochlea, which is susceptible of very easy motion. There exists too a large, movable, variously formed flap, the *tragus* or ear-cover, which serves to close the auditory canal and exclude sounds which the bat cannot endure,

or enables it to hear the lightest rustle. In fact bats hear the insects flying past them at a considerable distance, and this sense of hearing guides them in their course. Cruel experiments have been made to demonstrate this fact, and it has been found that the bat's flight becomes wild and uncertain when the ear or tragus is removed.

Their powers of sight and taste are less developed. But it is to a very exceptional delicacy of touch that must be attributed the ease with which bats fly about in their dark retreats without striking against the angles, rocky projections, or other objects. Spallanzani instituted experiments which were decisive in this respect. The celebrated physiologist destroyed the vision of several specimens, and on leaving them alone he saw them fly around the room without betraying the slightest hesitation, or without striking their heads against the furniture or the ceiling; in a word, without the deprivation of sight having changed in the slightest degree their condition of existence.

This fact induced Spallanzani to declare that bats are endowed with a sixth sense, which informs them of the proximity of solid bodies. But such an explanation is unnecessary. When we are aware of the prodigious sensibility of the tactile organs in these animals, we may admit that they are affected by certain movements of the air which are imperceptible to us, and that bats can thus be rendered conscious of the proximity of a body by the obstruction to the eddies and currents of air displaced by them in their flight.

The hair with which the bat tribe is furnished, is of a very peculiar character; and although closely resembling the fur of a rat or mouse when seen by the unaided eye, is so unique in aspect when seen under a microscope, that a bat's hair can be detected almost at a glance. Each hair is covered with very minute scales, which are arranged in various modes around a central shaft.

As might be expected from their structure, most of the bats walk very badly, all slowly and clumsily. Its mode of progression is as follows: The bat thrusts forward one of the fore-legs or "wings," and either hooks the claw at its extremity over any convenient projection, or buries it in the ground. By means of this hold, which it thus gains, the animal draws itself forward, raises its body partly off the earth, and advances the hind leg, making at the same time a kind of tumble forward. The process is then repeated on the opposite side, and thus the creature proceeds in a strange and unearthly fashion, tumbling and staggering along as if its

brain were reeling from the effects of disease. It steers a very deviating course, falling first to one side and then to the other, as it employs the limbs of either side.

In their general form the Cheiroptera resemble the Quadrumana, and like the latter the female has two teats. Their internal structure is peculiar, the skeleton is slightly but strongly built, the bones never have air-cavities as birds have, the vertebræ are broad and short, the ribs long, the legs very slender, the collar-bone and shoulder-blades thick and strong. The extraordinary development of the skin makes these creatures look larger than they really are, and in some species its immense growth in the nose and ears gives them their peculiarly repulsive look.

All the Cheiroptera sleep by day. They suspend themselves head downwards by the hind feet, frequently clinging to each other in compact masses.

In cold and temperate regions bats hibernate. They are then absolutely insensible, and may be handled, shaken, and even thrown in the air, without betraying the least movement. But if they are held for some time in the hands, or near a fire, under the influence of the heat they rapidly show signs of animation.

During the period of torpidity the vital functions are executed feebly, but they are not altogether abolished. They cannot dispense with nourishment during this portion of their existence, but as they are incapable of taking food, they devour their own substance, the fat that has accumulated in their bodies during the period of activity. In this way is explained their emaciation at the termination of their winter sleep.

Professor Owen writes: "The preservation of life in this passive state is due to the irritable property of the fibre of the heart, which is excited to contract by the blood in its carbonized state. The slow circulation of venous blood is the only recognizable vital act during hibernation, and the material conveyed by the absorbents is sufficient to counterbalance the slight waste. The bat is thus independent of supplies from without, but it purchases that independence by a temporary abrogation of its vital functions. Cold, senseless, motionless and asphyxiated, its entry into death's chamber is prevented only by its being brought to his very door."

Bats usually have only one offspring at a time. As soon as brought forth, the mother carefully cleans it, envelops it in her wings as in a

cradle, and holds it pressed against her breast to receive its first nourishment. After some days, the youngster can hang by the claws of its hind feet to the fur of the mother, and it is not rare to see her flying about with this strange burden. When, exceptionally, the progeny are double, then the winged nurse carries both in her aerial voyages.

The bats are a very difficult study, and it is quite uncertain how many distinct species are really known. The genera too are exceedingly numerous, and are in a very unsettled state, while the synonymy is exceedingly confused. We shall commence by dividing them into five families, the PTEROPIDÆ, or fruit-eating bats; the PHYLLOSTOMIDÆ, or leaf-nosed bats, among which the blood-sucking Vampire is found; the RHINOLOPHIDÆ, or horse-shoe bats; the VESPERTILIONIDÆ, or common bats, and the NOCTILIONIDÆ, or short-headed bats. We will mention their range of distribution under each family.



CHAPTER II.

THE FRUIT-EATING BATS OR FLYING FOXES—THE KALONGS—THE LEAF-NOSED BATS OR VAMPIRES
—ORIENTAL SUPERSTITIONS—THE HORSESHOE BATS—THE RHINOPOMA.

THE Fruit-eating Bats or FLYING FOXES, *Pteropidæ*, are pretty evenly distributed over the tropical regions of the Old World and Australia. They range over all Africa and the East of Asia northward to China and the South of Japan. They are found also in Australia and Tasmania, and in the Pacific islands as far east as Samoa; but do not occur in New Zealand or the Sandwich Islands.

Naturalists have divided the *Pteropidæ* into *nine* genera and *sixty-five* species, but an account of them all would be wearisome. We shall therefore confine our notice to a few species of the most characteristic genus, the PTEROPUS, from which the family derives its name.

THE KALONG.

This species, the FLYING FOX or KALONG of English travelers, *Pteropus edulis*, is the largest member of the order, and sometimes attains the size of a squirrel, with wings measuring four feet across. It has a muzzle somewhat like a dog's, pretty large, naked and pointed ears, and a highly developed flying membrane, which, however, between the hind legs is reduced to a narrow strip. It has no tail. Its dental formula is

$$\text{I. } \frac{2-2}{2-2}, \quad \text{C. } \frac{1-1}{1-1}, \quad \text{M. } \frac{5-5}{6-6} = 34$$

The color of the back is a deep brownish-black, that of the belly reddish-black, the head and neck of a reddish-brown.

It is found chiefly in the islands of the East Indian seas, and frequents the numerous orchards which surround the native villages, especially preferring the trees of the Durian, a fruit which Wallace says it is worth a voyage to the East to eat, so exquisite is its flavor. By day the Kalongs



COMMON BAT VAMPIRE BAT HORSESHOE BAT FRUIT EATING BAT
COMMON BAT
DOG HEADED BAT

PLATE IV. CHEIROPTERA

hang on the branches by hundreds and thousands and millions. By night they fly in bands so large that hours are required for the whole body to pass an observer.

Their food is fruit, chiefly the various kinds of figs and the mangoes; but occasionally they have been seen to eat little fishes, which they catch when they leap out of the water. The damage these enormous troops of creatures do is incalculable; but the natives pursue them less to restrain their depredations than to obtain a dainty for their kitchens. "At Batchian," Wallace writes, "these ugly creatures are considered a great delicacy and are much sought after. At about the beginning of the year they come in large flocks to eat fruit, and congregate during the day on some small islands in the bay, hanging by thousands on the trees, especially on the dead ones. They can be easily caught or knocked down with sticks, and are brought home by basketfuls. They require to be carefully prepared, as the skin and fur have a rank and powerful foxy odor. They are generally cooked with abundance of spices and condiments, and are really very good eating—something like hare."

The Kalongs are not the redoubtable animals represented by early travelers, who had the privilege of becoming first acquainted with them. These explorers allowed themselves to be imposed upon by their extraordinary dimensions, and their descriptions of them are ridiculous exaggerations. The truth is that the Kalongs never attack any animal, even the feeblest. They may, it is true, in the absence of their ordinary aliment, eat insects, but this is a rare exception; and they are only to be dreaded by man for the injury they do his gardens. Divers artifices are therefore resorted to, to prevent such destruction. For this purpose, in Java the fruit-trees are covered with network or wickerwork made with bamboo slips.

Another species, the *Pteropus Edwardsi*, is found in India and Madagascar. It is much less than the Kalong, and differs from it slightly in color, having on the back a broad stripe of yellowish-gray. It has been often brought to Europe, and Brehm has given an account of the behavior of a pair of them in captivity. They seemed to live in perfect harmony, and allowed themselves to be handled and stroked by those they knew; strangers they did not like, even of their own species. The Berlin Thiergarten was the scene of deadly combats between the flying foxes; difference of sex made no difference in the ferocity of the combats, in which one or both usually died from the bites

inflicted by the enemy. Even with the utmost care they rarely live long in confinement. Flight seems a necessity of their well-being, and, when kept prisoners, they contract ulcers on the wings and soon perish. Yet some specimens lived and produced young in the London Zoological Gardens, and Brehm's couple lived over two years in a cage.

The bats which belong to this genus are remarkable for the fact that they possess fewer vertebrae than any other known mammalian animal. In the entire spinal column, there are but twenty-four of these bones; this paucity of number being caused by the entire absence of a tail.

THE LEAF-NOSED BATS.

The PHYLLOSTOMIDÆ, or simple leaf-nosed bats, are found from Mexico and the Antilles to the southern limits of the forests east of the Andes and in Chili. One species, closely allied to the Mexican form, is found in California; and the Vampires, of which such terrible tales are told, belong to this family. The family has been divided by various naturalists into five groups; it is sufficient for us to say that it embraces *thirty-one* genera and *sixty* species. We will mention only the genera *Phyllostoma*, *Desmodus*, and *Macrotus*.

The members of this family are chiefly characterized by two nasal leaves, one in the form of a horseshoe, situated above the upper lip; the other disposed in the shape of a lance, and placed above the first. They have the mouth widely cleft, the tongue studded with horny papillæ, and in each jaw a pair of strong canine teeth, which project beyond the lips. They are of medium size, their hair is short and lustrous, and their inter-femoral membrane is more or less developed, according to the genera; the tail varies in length, or is altogether absent, as the species differ.

It is probable that all the leaf-nosed bats are blood-suckers, but only under certain circumstances. Hence we have very conflicting accounts.

The naturalist Azara, who observed a large number of these American bats, has afforded us valuable information concerning their habits. It is usually on the croup, shoulders, or neck, that they bite beasts of burden, because there they find a secure resting-place. The wounds they inflict are neither extensive nor deep, but are small incisions made by the horny papillæ with which their tongue is armed, and which only puncture the

skin. The blood, therefore, with which they gorge themselves comes, not from the veins or arteries, but from the capillary vessels of the skin. They sometimes attack sleeping poultry, and bite them on the crest or the other appendages which decorate their heads. Most frequently gangrene of the wound supervenes in these subjects, and death follows.

Azara fully confirms their sanguinary proclivities with regard to man, having himself on several occasions experienced their effects. At four different times this naturalist had his toes bitten when he was obliged to sleep in the open air. But the sensation was so painless that he did not awake, and knew nothing of his mishap until morning. He suffered from the effects of these wounds for some days, although he did not think it necessary to pay any attention to them.

The same traveler adds that they do not live on blood except when insects are scarce. He also gives an opinion, but without mentioning it as his own, or expressing his belief in it, but which is credited by the natives, that in order to lessen the sensation of pain in their victims, these animals fan with their wings the part they are about to wound.

Humboldt writes: "During the cool long night the cattle and horses cannot rest; for monstrous bats suck their blood while they sleep, or fasten themselves to their backs, causing suppurating wounds in which flies and insects settle. The bats which bit our dogs had long tails like the Molossi, but I believe they were the leaf-nosed varieties which possess a tongue that is a real sucking machine. The wounds were small and round; the dog howled from fear rather than pain. Still I have slept many a night under the open sky without being bitten. The bite is not dangerous, and the pain so slight that the bat is off and away before the sleeper awakes." Rengger states "that the wounds are a quarter of an inch in diameter and about two lines deep, never reaching the muscles, and showing no traces of teeth. The loss of blood is about three ounces from each wound." Burmeister, however, says that the loss of blood is very slight, and that he never knew of any man being attacked, or any animal dying of the wound. Hensel tells us that in Rio de Janeiro the stables require to be furnished with lamps and punkas to keep the bats from the horses. He does not attribute blood-sucking propensities to all the leaf-nosed bats. "Most of them have teeth like Carnivora, and produce wounds resembling those inflicted by beasts of prey; but the wounds caused by the blood-suckers are quite different; they seem to be produced by raising up the skin and then severing it by a horizontal cut. Hence

numerous capillary vessels of the skin are divided, and an abundant, long-continued bleeding results. Such wounds can only be effected by peculiar organs such as the genera *Desmodus* and *Diphylla* are endowed with."

Waterton, in his travels in South America, writes: "In the morning I heard my friend Tarbot swearing in his hammock. 'What's the matter?' I asked; 'Anything wrong?' 'The matter!' he replied; 'the bats have sucked me to death.' I found on examination that the bats had attacked his great toe; the wound was less than the bite of a leech. I conjecture that my friend lost twelve ounces of blood."

Bates, who lived eleven years in Brazil, was once bitten. His narrative of a night in a South American forest is not very cheering: "Towards midnight I was awakened by the rustling sound produced by bats flying to and fro. They had put out my lamp, and when I had relit it I noticed that the whole room was black with them. I laid about me with a stick and they disappeared through the roof; next morning I found a wound, evidently inflicted by bats, on my hip. The negroes assert that the Vampire is the only species which attacks man."

GENUS PHYLLOSTOMA.

The VAMPIRE, *Phyllostoma spectrum* (Plate II), is the largest of the South American blood-suckers. The head is thick; the snout projecting; the ears large; the nose-leaf small for the size of the animal; the tongue is flat, elongated and extensile, covered with papillæ so as to form a kind of sucking organ; the upper lip smooth, the lower lip covered with two large, bare, warty excrescences; the soft fur is chestnut-brown on the back, yellowish-brown on the belly.

Nothing is more hideous than the front view of this creature. The great, leathern, projecting ears, the protruding spear-like nose, the sparkling black eyes, form a whole which calls up the goblins of legend, and fits well with the Vampire's bloodthirsty reputation. Our introductory remarks will have shown that there is considerable doubt whether the Spectre Vampire deserves its character as a sucker of blood. Bates expressly states that it is well known to the natives of Brazil for its harmlessness. Still there is no wonder that a superstitious race should find its monstrous appearance an index to its disposition. Both

Bates and Waterton affirm that it is mainly frugivorous. The former opened the stomach of several specimens and found that they contained various kinds of seeds mixed with the remains of insects; the guava fruit is an especial object of their attack. The latter observed these bats in a moonlit night fluttering round the tree-tops evidently eating the buds. It is difficult to discover in many cases what species a traveler describes under the name of Vampire, and in ordinary language it designates all the bats that suck blood.

GENUS DESMODUS.

This genus possesses nasal leaves in the form of the letter V, large ears that stand wide apart, no tail, and a mere strip of femoral membrane. The crowns of the molars form a long cutting-edge. The "tragus," or inner ear, is long and pointed.

The species *Desmodus rufus*, which is usually regarded as the representative of the genus, is russet-brown on the back, but silver-gray on the under surface. The nasal leaf, ears, arms, and legs are thinly clothed and appear flesh-colored; its length is about two inches and a half, its spread of wing twelve inches. It is abundant in Brazil. Hensel states: "In capturing these animals, I have often seen the wounds they inflicted on the noses of my dogs and on my own hands; they bite with lightning speed: even when they appear only to touch the skin, a part is soon felt to be removed. They do not hold on with their teeth like other varieties."

GENUS MACROTUS.

The CALIFORNIAN VAMPIRE, *Macrotus Californicus*, although a quite distinct species, is nearly related to some of the West Indian bats. It has a long head and a face covered with hair, which grows somewhat thinly on the large oblong ears, while the neck behind them is almost bare. The fur is white and fawn-colored, each hair being tipped with white, but that on the face is somewhat inclined to brown. Its dental formula is

$$\text{I. } \frac{2-2}{2-2}, \text{ C. } \frac{1-1}{1-1}, \text{ M. } \frac{5-5}{6-6} = 34.$$

THE HORSESHOE BATS.

The family Rhinolophidæ, which embraces *seven* genera and *seventy* species, derives its scientific name from a curious crest-like membrane on the nose. They are found most abundant and varied in Eastern Asia, where twelve species are found. Africa and Australia possess five, Europe one genus only.

The nasal appendage consists of three portions—the horseshoe, the longitudinal comb, and the lancet. The former begins at the end of the snout, and surrounds the nostrils with a deep fold of skin. The comb rises up inside the horseshoe behind the nostrils. The lancet rises up between the eyes under the posterior end of the horseshoe, and contains three cellular cavities. The ears are simple, without an inner ear; the flying membrane short, and the flight clumsy. The tail is short, and the interfemoral membrane entirely embraces it. At the flanks two glands are found which have the appearance of mammæ, and secrete an odoriferous substance. The Rhinolophidæ differ but little in size from the Vespertilionidæ; they have a long, abundant fur, generally of a light shade, which is sometimes remarkably handsome.

These Cheiroptera are widely spread in the Old World, in Europe, Africa, Asia, and the islands of Sunda; no species are found in America. They live in numerous bands during the greater part of the year. When the females are with young, they separate themselves from the males, to bring forth and rear their progeny. The following genus contains the "Horseshoe Bats" proper:

GENUS RHINOLOPHUS.

The LESSER HORSESHOE BAT, *Rhinolophus hipposideros*, is not uncommon in Europe. During its winter sleep it folds itself so closely in its wings that it seems a fungus rather than an animal. Its chief food is soft-bodied insects, like flies or moths, but it is said to be a blood-sucker, on very inconclusive observations. It attains the size of only two inches, with a spread of eight inches in the wings, and is distinguished from the following species by an additional appendage to the nose, placed in front of the ordinary lancet.

The GREAT HORSESHOE BAT, *Rhinolophus ferrum equinum* (Plate II), is much larger, sometimes measuring eighteen inches across the wings.

The NOBLE HORSESHOE BAT, *Rhinolophus nobilis*, is the largest of the genus, measuring four inches in length, and twenty inches from tip to tip of the wings. It is a native of Java, and has very fine and long hair, the color being brownish on the back and grayish beneath. The nasal appendage is a broad membrane, stretching transversely across the nose like a shelf. The sides are bounded by parallel folds, and the inferior portion is semicircular, with an obtuse point in the middle.

GENUS MEGADERMA.

The AFRICAN LEAF BAT, *Megaderma frons*, is more properly a member of the Horseshoe family than of the Vespertilionidae, with which some writers class it. The nose has three leaflets—one horizontal, one vertical, and one of the horseshoe form. The ears are very large, furnished with a tragus, and united over the forehead so as to give a heart-shaped appearance to the head. They are blood-suckers.

Of the *four* or *five* species known, the most important are the Leaf-nosed Megadermes, which inhabit Madagascar, and the Lyre Megadermes, found in Senegal. The latter measures fourteen inches across the wings.

GENUS NYCTERIS.

This genus, with *three* species, is found in the Moluccas and Africa. The nose is pierced by a cavity in which the nasal-leaf is concealed; the tail is of medium size, and supports the interfemoral membrane throughout its length. They measure from eight to ten inches across the wings, and possess a contrivance by which they can increase their size without augmenting their weight. Two very small openings afford a communication between the mouth and the space between the skin and flesh, which are only tied to each other by a few membranous threads at each side of the neck and on the sides of the thumb; when, therefore, the bat desires to inflate its body, it closes its mouth and forces the air through the cheek-passages into the empty space between the skin and flesh. The result of this operation is that the skin is puffed out, so that the

creature looks like a little ball of fur to which the head and limbs had been artificially attached.

GENUS RHINOPOMA.

This curious Indian genus, which is sometimes classed with the *Nocilionidæ*, has a long tail, a narrow femoral membrane, and a peculiar dental formula,

$$\text{I. } \frac{1-1}{2-2}, \quad \text{C. } \frac{1-1}{1-1}, \quad \text{M. } \frac{4-4}{5-5} = 28.$$

The best known species, *Rhinopoma microphyllum*, is found in Bengal and Egypt. It is a small, long-haired, light-gray bat, about two inches long. The tail is remarkable for its length, and contains eleven vertebræ. It is found in great numbers in the old ruins on the Nile, and hangs in masses that quite hide the roof. In the evening they are seen skimming across the waters, especially during the inundation, in quest of insects.



CHAPTER III.

THE TRUE BATS.

THE COMMON BAT—THE TAPHOZOUS—THE PIPISTRELLE—THE BARBASTELLE—THE NEW YORK BAT—THE CAROLINA BAT—THE HOARY BAT—THE CALIFORNIA BAT—THE GREAT BAT OF BRITAIN—THE SHORT-EARED BAT—THE LONG-EARED BAT—THE BIG-EARED BAT—THE NOCTILIONIDÆ—THE GENUS NYCTICEIUS—THE GENUS NYCTINOMUS—THE GENUS NOCTILIO.

OF the numerous recognized species of bats, nearly *two hundred* belong to this family, the VESPERTILIONIDÆ. They are placed under *eighteen* genera, all agreeing in the following characteristics: the nose is simple, with leafy appendages, the ear has always a tragus or cover, the pointed molar teeth have an edge somewhat in the shape of a W. The dental arrangements are very varied, and on them the division into genera is founded. The incisors, which are pointed, are two, four, six, or more in the upper jaw; usually four, rarely six, exceptionally two, in the lower. The canines and false molars vary from one to three above, and from two to three below, while the molars are three on each side. Thus the number of teeth varies from twenty-eight to thirty-eight.

Equally various are the sizes of these bats. Some measure five inches in the body and two feet across the wings; others attain only a length of one inch and a half and seven inches of wing-spread. They are most numerous in America, but are found everywhere outside of the polar circles. They prefer to live in trees, on the branches, rather than in holes or caverns. Some live in large bands, some are solitary, or at most form very small societies. They live almost exclusively on insects, at times on small animals, but it is not ascertained whether any of them eat fruit. They may be described with justice as the most useful of the Mammalia. Their flight is abrupt and full of sudden turns, thus baffling birds of prey. They climb and run very well; their sense of hearing is highly developed. We will notice only the principal genera of this family.

GENUS TAPHOZOUS.

The animals belonging to this genus are natives of Africa and the hot parts of Asia. They are characterized by a hollow forehead and a somewhat short tail, which is detached and projects downward. Their wings generally have a span of from eight to twelve inches. It contains *ten* species.

GENUS VESPERUGO.

This genus is distinguished by short, thick, fleshy ears, set wide apart and rounded in front, the tragus or cover of the ear projects, the wings are pretty long with a thick membrane, and the tail is as long as the body.

The NORTHERN BAT, or *Vesperugo Nilsonii*, attains a length of about ten inches. Its color on the upper surface is dark-brown, on the lower somewhat lighter. It is found in the north of Sweden and Norway, probably extending to the Arctic circle, and in Russia. It does not suspend itself by the hind feet during its period of hibernation, but hides in crevices from which only its snout projects. It migrates southwards in the summer, because in the far north the days of June and July are too long to suit nocturnal animals.

GENUS VESPERTILIO.

This genus is found over the whole of the Northern Hemisphere, and contains many species. The wings are slender and capable of quick movement and great endurance; the covering of the ear is directed inwards, and the tail is included in the flying membrane.

THE PIPISTRELLE.

The PIPISTRELLE, *Vespertilio pipistrellus* (Plate IV), is the smallest European bat. It is only two inches and a half long, of which length full one inch is taken up by the tail. The fur is a yellowish red-brown above, inclining below more to yellow. The thick ears and membrane are brownish-black.

It inhabits almost all Europe and North and Central Asia, and extends from Spain to Japan. It is exceedingly common in Germany, where no town, no village, no farm does not harbor them. It is the COMMON BAT of Great Britain.

Its flight is marked by great adroitness. In the bright evenings it is seen sometimes skimming over the surface of small pools, but oftener flitting to and fro between the stems of the trees. In villages it seldom rises higher than the second story, and never flies far in the centre of the street, but keeps near the houses. It is fond of entering lighted rooms, but avoids low and small chambers.

They can be tamed to a certain extent, and soon become familiar with the people whom the relations of every day have taught them to recognize. Dr. Franklin says that he has seen, in several farms in England, bats which were perfectly tame. These little creatures lived in the same room with the farmer's family. If any one, holding an insect between his lips, imitated the buzzing of a fly, they perched upon his shoulder, sought for the insect around his mouth, and even seized it from between his lips.

Its mode of eating is peculiar. According to White's "History of Selborne," if you give it anything to eat, it brings its wings round before the mouth, hiding its head. It is capable of running on the ground, and is an agile climber.

They are exposed to many enemies; hawks attack them in summer, weasels and mice invade their hiding-places in winter, but it finds its bitterest enemy in man.

The SEROTINE, *Vespertilio serotinus*, has the ears pretty large, the fur long and soft, the color reddish-brown passing into dull-yellow beneath the body. Its flight is slow, and it is generally found solitary or in pairs.

The MOUSE-COLORED BAT, *Vespertilio murinus*, measures three inches and a half from the snout to the root of the tail. The head is narrow in front and elongated, the eyes conspicuous, the ears sharply pointed. It is described as a very pugnacious animal.

THE BARBASTELLE.

The BARBASTELLE or BULLDOG BAT, *Vespertilio barbastellus*, (Plate IV), measures three and a half inches, and has a spread of wing of ten inches. The color is blackish-brown, inclining to gray beneath. The

ear is tolerably large and wrinkled, with a sharp-pointed tragus. It is found all through Europe, and has been often observed in captivity. It is of more gentle disposition than most bats, and soon recognizes its keeper; a couple of days render it comparatively tame. It is not very active, and one kept by Bell, the naturalist, preferred lying on the hearth-rug to using its wings; it fed on meat.

During hibernation, they hang by their hind legs usually at the entrance of caverns, where they sometimes have been seen perfectly enclosed in icicles.

THE CALIFORNIA BAT.

The CALIFORNIA BAT, *Vespertilio nitidus*, is to be carefully distinguished from the previously-described California Vampire. The body is small, its spread of wing seven inches, the head and face hairy, the ears longer than the head, the foot small, the tail usually embraced in the interfemoral membrane. The fur is silky, of a brownish tint, becoming lighter in front. As far as known, it has never been found to the east of the Rocky Mountains.

THE NOCTULE.

The NOCTULE, *Vespertilio noctula*, is one of the largest species. Its length is sometimes four inches, including one inch of tail. When its wings are expanded they measure fourteen inches.

It is found over a great part of the Old World, preferring lowlands and valleys. During the summer days it sleeps in clefts of trees, but during their winter-sleep hundreds are found clinging to each other in old ruins. Its flight is strong and high, and it turns with such dexterity as to escape almost all attacks from birds of prey. The Noctule is commonly called in Great Britain the GREAT BAT, but it possesses a more popular appellation derived from its sharp and piercing cry, that of the "Jacky Screamer." It does not make its appearance till the end of April; it emits an offensive odor.

THE SHORT-EARED BAT.

DAUBENTON'S BAT, *Vespertilio* (or *Brachyotus*) *Daubentonii*, has ears which, when pressed down, scarcely reach the top of the nose. It measures an inch and a half in the body, and about one inch in the tail.

It is easily distinguished from bats of the same size by its short ears and the absence of wing-claws. In Germany it is called the WATER BAT, as it loves well-watered regions, where it is found occasionally in extraordinary numbers. It seems to prefer chalk quarries for the scenes of its hibernation, and it lives in societies.

Ponds near houses and gardens are their favorite haunts, and they skim within a hand's-breadth of the surface; if a bridge comes in their course they always pass under the arches. By day they hang in clusters on branches over the water.

The LITTLE BROWN BATS, *Vespertilio subulatus*, common throughout the Middle States, and the BLUNT-NOSED BAT, *Vespertilio lucifugus*, extending throughout the United States as far as Mexico, call for no remarks.

GENUS SCOTOPHILUS.

The CAROLINA BAT, *Scotophilus Carolinensis*, has oblong ears as long as the head and rather velvety. The projecting portion of the ear is heart-shaped. The fur is chestnut-brown above and yellowish below.

The GEORGIAN BAT, *Scotophilus Georgianus*, is of a dark-brown color on the back, brighter in front, and the fur is thick, soft, and long; the head is somewhat flat, and the point of the tail is not involved in the membranous wings.

GENUS LASIURUS.

The NEW YORK BAT, *Lasiurus noveboracensis*, has short and broad ears, and a rather pointed, short nose. The fur is soft and thick, and there is a white spot at the origin of the wings. It is sometimes called the RED BAT, and is found in New York, Pennsylvania, and on the Missouri.

"Godman's Natural History" relates: "In June, 1823, a son of the keeper of a city park in Philadelphia brought home the young one of one of these bats. Three hours afterward its mother made her appearance and followed the boy two blocks, finally alighting on his breast. Both were brought to the museum, the young one firmly adhering to the mother's teat."

The HOARY BAT, *Lasiurus cinereus*, is common in the Rocky Mountains. The ear is large, but shorter than the head; the tragus obtuse and bow-shaped. The nostrils are wide apart, the canine teeth large, and there is only one incisor on each side. Its fur is long and of a black-brown at the base, then of a brownish-yellow, then blackish, then white, and from the mixture of these tints is derived its name. It is nearly four and a half inches long—that is, it is nearly twice the size of the New York Bat, with which it has much affinity.

GENUS PLECOTUS.

The LONG-EARED BAT, *Plecotus auritus*, derives its name from its highly developed ears. These appendages are nearly as long as the whole body, and are remarkable for their transparency. The wearer has the strange power of contracting and expanding his ears, producing sometimes graceful folds and festoons, at other times a feathery appearance. When flying they usually curve them backward, so that merely the long, pointed tragus stands up. When it hangs itself up to sleep, it covers its ears with the arms.

The Long-eared Bat bears captivity better than most of his fellows, can be easily tamed, and exhibits a very amiable disposition. The prisoners soon become bold and familiar; they are very cleanly, not only cleaning themselves after their meals, but occasionally assisting each other. They are playful and pretend to bite one another, but they never harm their companions of the same species.

GENUS SYNOTUS.

This closely allied genus is one of the genera peculiar to the South-eastern and Central States. It is characterized by very large ears, the inner border of which continues as a nasal excrescence, and has no tongue-shaped development, as in the genus *Plecotus*.

The BIG-EARED BAT, *Synotus macrotis*, is found in the South Atlantic States. It measures ten inches from wing-tip to wing-tip; the hair is long and fine, of a blackish-brown color. A very similar species, the *Synotus Townsendii*, is found on the Upper Missouri.

GENUS ANTROZOUS.

This genus possesses a large head, high tapering nose, slender truncated snout, large eyes, and ears longer than the head.

The PALE BAT, *Antrozous pallidus*, is found in the Pacific States and Texas, and exhibits two varieties—one fawn-colored, the other yellowish-brown; in the latter the interfemoral membrane is bare.

THE NOCTILIONIDÆ.

The DOG-HEADED BATS are very unequally distributed. Their headquarters are in the tropical regions of America, where most of the genera into which the family is divided are to be found. They range from Mexico to Chili on the West Coast, and Buenos Ayres on the East, and one species occurs in California. New Zealand and Norfolk Island each possess one species. The New Zealand species, *Mystacina tuberculata*, seems to form a connecting link between the Noctilionidæ and the Phyllostomidæ.

The Noctilionidæ have the ears usually joined, the lips are pendulous, the nose sharp, the tragus is broad and square. The tail extends beyond the interfemoral membrane, and the great toes are fringed on the outside. Various classifications of this family have been made; some authorities include in it the *Rhinopoma*, which we have placed with the Rhinolophidæ, and the *Taphozous*, which we class with the Vespertilionidæ.

The genera are *fourteen* in number, but their differences are only interesting to the professed student of natural history.

GENUS NYCTICEIUS.

This North American genus contains only *one* species. The head and ears resemble those of the *Vesperugo*.

The CREEK BAT, *Nycticeius crepuscalons*, is found from New York to the Rocky Mountains, and southward to New Orleans. The fur is rather short, and brown, with yellow tips to the hair.

GENUS NYCTINOMUS.

This genus has pointed ears, thick hanging lips, and a sharp nose. The great toes are separated from the others and fringed on the outside.

The *Nyctinomus nasutus*, called likewise *Molossus* or *Dysops nasutus*, is found in South Carolina, but most extensively in South America. As befits its name of *nasutus*, the nose is well defined; the head is large, the lips pendulous; the ears are as broad as they are long, and almost join at the base. The fur is soft and thick, of a yellowish-brown, tipped with white, and covers the lower part of the ears. The tail projects some distance beyond the interfemoral membrane, and the toes are supplied with long hairs.

Another species, the *Nyctinomus obscurus*, is nearly the size of the *Barbastelle*, and measures three inches. The head is short, the muzzle swollen, the ears large.

GENUS NOCTILIO.

The DOG-HEADED BAT, *Noctilio Americanus* or *leporinus*, is the best known of the *two* species of this genus. The ear is short, narrow, and pointed; the muzzle conical, the nose overhanging the lips; the upper canines very long. The fur is of a reddish-yellow, and does not extend to the flying membrane. The second species, *Noctilio albiventer*, is much smaller, and the fur on the belly is yellowish-white.

The bats are a very difficult study, and it is quite uncertain how many species are known; the most probable estimate is that of Mr. Murray, who gives a list of four hundred species. For American Bats, the reader who desires to pursue the subject is referred to the exhaustive monograph of Dr. Allen, in the Transactions of the Smithsonian Institute. For the Cheiroptera in general Mr. Dobson's elaborate Catalogue is the latest authority.



ORDER III.

INSECTIVORA.

14. GALEOPITHECIDÆ - - - - FLYING LEMURS.
15. MACROSCOLIDIDÆ - - - - ELEPHANT SHREWS.
16. TUPAIADÆ - - - - - SQUIRREL SHREWS.
17. ERINACEIDÆ - - - - - HEDGEHOGS.
18. CENTETIDÆ - - - - - TENRECS.
19. POTAMOGALIDÆ - - - - OTTER SHREW.
20. CHRYSOCHLORIDÆ - - - - GOLDEN MOLES.
21. TALPIDÆ - - - - - MOLES.
22. SORICIDÆ - - - - - SHREWS.

Insectivora

CHAPTER I.

CHARACTERISTICS OF THE ORDER—ITS DIVISION INTO NINE FAMILIES—THE GALEOPITHECIDÆ—THE FLYING LEMURS—THE MACROSCOLIDIDÆ OR ELEPHANT SHREWS—THE GENUS RHYNCHOCYON—THE GENUS PETRODROMUS—THE TUPAIADÆ—THE BANGSRING—THE PRESS—THE GENUS HYLOMYS—THE GENUS PTILOCERCUS—THE PENTAIL.

THE third order of Mammalia, the INSECTIVORA (from *Insecta* “insect,” and *voro* “to devour”), embraces numerous animals which, like many of the Cheiroptera, feed on insects, for the consumption of which they are specially adapted by the formation of their teeth.

The distribution of the INSECTIVORA over the habitable globe is remarkable; they are completely absent from South America and Australia; some genera only found in Madagascar have allies in the West Indian islands; the hedgehogs, so common in Europe, are unknown in North America, and the majority of the species of the order belong to one genus, *Sorex*. From these facts it is evident that they are the detached fragments of a much more extensive group of animals which are gradually diminishing in number and which are now almost extinct. In the terrible struggle for existence which has gone on since life first made its appearance on the globe, the INSECTIVORA have not held their ground, except in special localities or by the favor of special circumstances. Some have been saved from the severe competition with other mammals by their isolation in regions like Madagascar; the MOLES have escaped extermination by their habits; the HEDGEHOGS by their prickly armor; and others, like the ELEPHANT SHREWS and SQUIRREL SHREWS, owe their safety to the likeness they present to dominant groups in their own districts. It is only under special conditions that they can maintain themselves against more highly organized forms.

The animals of this order exhibit remarkable deficiencies and remarkable developments of particular parts. The body as a rule is compact, the head long, the nose prolonged into a snout; the limbs, with the exception of the tail, and, in some species, of the hind-leg, are shortened excessively; the clothing of the body varies from the velvety skin of the mole to the sharp, stiff, erectile spines which defend the hedgehog. Their limbs are adapted for walking, swimming, and digging. They are all plantigrade, that is, in walking they apply the whole sole of the foot to the ground.

Their intelligence is very slight; they are dull, shy, and distrustful, loving solitude, yet of violent tempers. Most of them live a subterranean life, but some frequent the waters, some the trees. Their astonishing energy is an essential check on the increase of worms and insects, and even of the smaller rodents.

A look at the jaws of an insectivorous animal immediately convinces us that the creature is carnivorous to a greater degree than such Carnivora as cats or dogs. The jaws bristle with pointed teeth, daggerlike spears take the place of canines, and sharp pyramids resembling a double saw complete their dentition. The whole structure is formed to seize and hold fast even hard-shelled insects like cock-chafers. The jaws of a shrew-mouse enlarged to the size of a lion's, would be far more terrible and appalling in the ferocity of their appearance.

In spite of the benefits conferred on us by these creatures in destroying our insect pests, the prejudice of man accuses them of divers imaginary crimes. In England the shrew is considered venomous, and every village has a mole-catcher.

Many of the INSECTIVORA hibernate. As cold approaches thousands upon thousands of the victims destined to feed the members of this order, are removed from their clutches. Hence, as the INSECTIVORA cannot, like the birds, migrate in quest of food, they are providentially given the faculty of hibernation. Of course, those that prey on creatures which do not disappear in winter, have no need to pass the cold season in torpid slumber.

We follow the latest authorities in classing the animals of this order in *nine* families, and commence with the family of the FLYING LEMURS or COLOGOS, which present a striking resemblance to the "Flying Foxes," and seem to form an intermediate link of transition.

THE FLYING LEMURS.

The family GALEOPITHECIDÆ contains only *one* genus, which again contains only two species. For a long time the COLUGO, *Galcopithecus volans*, (Plate V) was placed among the Lemuroidea. Its food seems to be entirely vegetable, and its flying membrane shows some relationship to the Cheiroptera. Its dental formation settles its place among the Insectivora, but the fact that the young are born very small, blind and naked, and are closely attached to the wrinkled skin of the mother, indicates some affinity to the Marsupialia. This animal indeed seems to be a lateral offshoot of some low form which has survived during the process of development of the Insectivora, Lemuroidea and Marsupialia from an ancestral type.

The FLYING LEMUR is as large as a cat, with a slender body and limbs of moderate length. Attached to the extremities of these limbs is a membrane which envelops the animal from the neck to the extremity of the tail, and which permits it to sustain itself in the air. The fingers of all the feet have retractile claws and the thumbs are not opposable. The head is small, the muzzle prominent, the eyes moderately large, the hairy ears small. The membrane between the limbs is merely a parachute. When the Colugo desires to make a leap it spreads its limbs so that the membrane may present as large a surface as possible. The membrane is not used as a wing, and the Colugo cannot rise. At every leap the spot it aims at must be lower than that from which it starts; hence after a few aerial voyages it is compelled to climb a tall tree and begin afresh. At rest the membrane folds so closely as to be almost indistinguishable. The Colugo has two mammæ. The lower incisors are set pointing forward, and are notched like the teeth of a saw, and the molars are studded with points like those of all the Insectivora.

The Galeopithecæ are essentially nocturnal. They are seen at night moving actively through the trees. On the ground they run with agility. Their flight is noiseless. Insects constitute the staple of their food but they are fond of fruit, and even devour small birds.

In order to rest, these animals suspend themselves by their hind paws to the branches of trees, like bats. The people of the regions they inhabit choose this opportunity for capturing them: and not-

withstanding the disagreeable odor their flesh exhales, eat them without repugnance.

The Colugo attains a length of two feet, including the tail; the back is thickly covered with hair of a brownish-red color, becoming darker on the under surface. It is found in Sumatra, the Moluccas, and the Philippine Islands.

It is difficult to obtain any satisfactory account of the habits of the Colugo in its native forests, as many travelers have, beyond all doubt, confused it with the Flying Fox (*Pteropus edulis*). Nearly all the information we possess is given by Wallace: "This creature has a broad membrane, extending all round its body to the extremities of the toes and to the point of the rather long tail. This enables it to pass obliquely from one tree to another. It is sluggish in its motions, at least by day, going up a tree by short runs of a few feet, and then stopping a moment as if the action were difficult. It rests during the day clinging to the trunks of trees, where its olive or brown fur, mottled with irregular whitish spots and blotches, resembles closely the color of mottled bark, and helps to protect it. Once in a bright twilight I saw one of these animals run up a trunk in a rather open space, and then glide obliquely through the air to another tree, on which it alighted near the base and immediately began to ascend. I paced the distance from one tree to another and found it to be seventy yards, and the amount of descent I estimated at not more than thirty-five or forty feet, or less than one in five. This, I think, proves that the animal has some power of guiding itself through the air. The Galeopithecus feeds chiefly on leaves, and possesses a very voluminous stomach and long convoluted intestines. The brain is very small, and the animal possesses such tenacity of life that it is exceedingly difficult to kill it by ordinary means. The tail is prehensile, and is probably made use of as an additional support while feeding. It is said to have only a single young one at a time; and my own observation confirms this statement, for I once shot a female with a very small, blind, and naked creature clinging closely to its breast, which was quite bare and much wrinkled. On the back and over the limbs and membrane the fur of these animals is short but exquisitely soft, resembling the chinchilla."

A German traveler writes: "We heard a shriek so peculiar and painful that we seemed to hear the cry of a child or the scream of some sufferer. Weird and disagreeable, it echoed from time to time through



PEN TAIL SHREW
TENREC
OTTER SHREW

HEDGEHOG

FLYING LEMUR
COMMON MOLE
COMMON SHREW

STAR NOSE MOLE

COMMON SHREW

SQUIRREL SHREW
ELEPHANT SHREW

PLATE V. INSECTIVORA.

the still night; the natives drew up around our fires; fear of spirits silenced their merry chatter. But the secret was soon betrayed: the spirit whose voice resembled a distant cry of pain came in sight and hovered slowly over our heads. It was a Flying Lemur."

A female that lived for some time in captivity is described as a harmless, stupid creature. "It lay on its stomach with all its legs stretched out, and then slowly and awkwardly hopped to the wall of the room, which it tried to ascend. As the wood was planed it could not take good hold of the surface, and after climbing a few feet it fell down again, but the fall was always broken by the expanded membrane with which nature has provided it." We do not possess much further knowledge respecting the Flying Lemur.

THE ELEPHANT SHREWS.

The animals of the family MACROSCOLIDÆ are extraordinary little creatures, and are called "elephant" on account of their trunk-like snout, and "long-legged" because their hind-legs resemble somewhat those of the Kangaroo. They are almost confined to South Africa, and extend up the East Coast as far as the Zambezi and Mozambique. They are divided in *three* genera and *ten* species; but two of the genera, PETRODROMUS and RHYNCHOCYON, are each represented by a single species.

The ELEPHANT SHREWS are essentially leaping animals; the hind-legs are enormously elongated, and they possess usually five, sometimes four short toes, with short, weak claws. The thin, short-haired tail is a little shorter than the body; the fur is thick and soft; the teeth number forty; the long, proboscis-like nose is perforated at its extremity by the nostrils which are placed obliquely, and it doubtless aids the animal in its search for food, while the enormous length of its hinder-limbs enables it to catch its prey with wonderful agility.

I.—GENUS MACROSCOLIDES.

The typical ELEPHANT SHREW, *Macroscelides proboscideus* (Plate V), attains a length of nine inches, of which four and a half belong to the tail. The snout is nearly an inch in length, and reddish-black at the end. The coat is a reddish-brown or mouse-gray, more or less bright, with shades of white on the lower surface of the body; the ears are white

inside. They frequent stony mountains; and under stones, in deep and almost inaccessible recesses, in clefts of the rock, and holes of the earth, they find refuge from danger. They love the sunlight, and are most active during the scorching hours of noon; their food consists mainly of insects, which their long legs enable them to catch or their long snout to find in rifts and clefts. They are very timid, and the slightest motion sends them into their hiding-places; after some time, one after another sallies out, hops about, looking and listening on every side; then they begin to snuffle at the stones or catch, at a spring, some passing insect. Their habitations are made below the surface of the ground, and consist of a deep and tortuous burrow, the entrance to which is a perpendicularly sunk shaft of some little depth.

The rapidity of their movements and the speed with which they take flight render it a difficult task to capture them; but when captured they endure confinement pretty well, are gentle and graceful and soon gain the sympathy of man.

Seven of the species are found in Southern Africa; *one*, the TRUNKED RAT, *Macroscelides Rozetti*, has been found in Algeria. It is said that some ingenious soldiers of the French army, quartered there, have at times been induced to meet the demand for specimens by a manufactured supply. An erudite naturalist was delighted at purchasing from a Zouave a magnificent specimen of the Trunked Rat, till closer examination showed him that it was a common rat with an inch of its own tail grafted by a little incision on the end of its nose.

II.—GENUS RHYNCHOCYON.

The RHYNCHOCYONS are also leaping animals, consequently have the hind quarters more elevated than the fore ones, but their bodies are more slim, and they are altogether larger than the *Macroscelides*. Besides this, they are "tetradactylous"—that is, their limbs are terminated by only four toes.

The *only* species known, the *Rhynchocyon cirnei*, was discovered in Mozambique by the traveler and naturalist Peters. Its muzzle is prolonged into a very conspicuous proboscis; the eyes are large, the ears moderate, while the tail is considerably developed. The outer toe is widely separated from the others in the fore-feet. It possesses thirty-six teeth.

The third genus—*Petrodromus*—is represented by one species which inhabits Mozambique. It has the general characteristics of the family, and, as its name implies, is most frequently found in rocky neighborhoods.

THE SQUIRREL SHREWS.

The family TUPAIADÆ embraces *three* genera divided into *ten* species. They are often called Squirrels, and have a superficial likeness to these denizens of our forest. They are all natives of the Indian Archipelago and the adjoining continent. The head is pointed and ends in a snout usually bare at its blunt extremity, the body is slender, the tail long—sometimes very long and bushy, having two rows of hair hanging equally on each side; the fur is thick and soft. They have from thirty-eight to forty-four teeth, which are remarkable from the fact that the canines are shorter than the incisors. The eyes are large, the ears rounded, the limbs regular, the feet have bare soles, and the five toes are separated and armed with short, curved claws. The female has four teats.

The development of the eye indicates their diurnal habits, and the curved claws, that they can climb.

I.—GENUS TUPAIA.

The TUPAIA TANA, *Tupaia Tana*, is the largest of the *seven* species of this genus. It has a bushy tail with the hair hanging evenly down on each side, large prominent eyes with a bony ring closing in the orbit behind, and thirty-eight teeth. It is distinguished from other species by the great length of its tail, and it wears a dark-brown blackish fur which displays on the underside a ruddy tinge and appears mixed with gray on the head and muzzle. A gray stripe crosses the back of the head, and a dark-brown line runs down the back. Each hair consists of gray and dark-brown rings alternately. It is very nearly the size of the common squirrel. We know little of its wild habits. It is described as an agile, active, merry creature, which uses its crooked claws excellently, and climbs with all the skill of an ape. It is not strictly insectivorous—it sometimes eats fruits which it picks from the branches or off the ground.

THE PRESS.

The PRESS, or SQUIRREL SHREW, *Tupaia ferruginea* (Plate V), is a very pretty creature so like the squirrel that, as it runs about, it can be distinguished only by the elongated outline of the head. It measures about thirteen inches, including five inches of tail; the length of the head being two inches. Its height, as it stands or all-fours, is about three inches.

The coloring of its fur is a brownish-maroon, which in some parts, as the spine, is deepened into a rich brownish-black, and in others, as the ribs and flanks, is warmed into a reddish tint. Hence the epithet of *ferruginea* or "rusty" has been applied to the animal. This change of color is caused by the mode in which the hairs are marked in alternate rings of black and maroon. Those which run along the back are black, with a fawn-colored ring in the middle, but those which grow upon the ribs are fawn, with a black ring in the middle. The ears are black. Upon the under surface of the body the fur is of a whitish-yellow, fading into gray. The long and bushy hairs which decorate the tail are so dotted with white that they give a grayish-brown effect.

Although the teeth of all the *Tupaia*s are evidently of an insectivorous description, the Press, as well as its congeners, feeds chiefly on coleopterous insects, but varies its diet with certain fruits. It is affirmed that the Press partakes so far of the carnivorous propensities of the mole, that it will sometimes pounce upon small birds as they are hopping among the branches, and make a meal upon their bodies. One of these animals that was tamed, and accustomed to roam about the house at will, was very fond of milk and fruits, and used to attend at every meal for the purpose of obtaining these coveted luxuries.

THE BANGSRING.

The BANGSRING, *Tupaia Javanica*, abounds in the dense forests of Java. It differs from the preceding species by the length of its tail, which is fully as long as its body, of a uniform thickness and clothed with hairs that spread out like those on the squirrel's tail. The fur is close and fine, with a few longer and darker hairs interspersed in its prevailing hue of grayish-brown. It is easily tamed. Sir Stamford Raffles describes one which behaved like a pet spaniel, and ate fruits and milk at the table of its owner.

II.—GENUS HYLOMYS.

This genus is characterized by the shortness and bareness of its tail, and by the absence of the bony ring around the orbit of the eye, which is such a peculiar feature in the genus *Tupaia*. Two species only are known.

The HYLOMYS, *Hylomys suillus*, is a small species which is found in Sumatra and Java, where it lives on the hills, two thousand feet above the sea-level. It is by no means common. The muzzle is developed into a movable proboscis, turning in a downward curve at the tip, where the nostrils are placed laterally. The eyes are not prominent or large, but the ears are of considerable size. It possesses forty-four teeth; the three central toes in the feet are longer than the rest.

III.—GENUS PTILOCERCUS.

This genus is known only by *one* species, a specimen of which is preserved in the British Museum.

THE PENTAIL.

The PENTAIL, *Ptilocercus Lowii* (Plate V), is an extraordinary creature which was first described by Mr. Low, who captured one of them in the house of Sir James Brooke, the Rajah of Sarawak. It derives its name from the resemblance borne by its tail to the old quill pen of our ancestors. It is about the size of a rat, but appears to be of greater dimensions, on account of its extremely long tail with the remarkable appendage at its extremity. As represented in the plate, the tail is of extraordinary length when compared with the size of the body, and is devoid of hair, except at its extremity, where it is furnished with a double row of stiff hairs on each side, which stand boldly out, like the barbs of an arrow. The remainder of the tail is covered with scales, which are square in their form, like those of the long-tailed rats, and of considerable size. The color of the tail is black, and the bristly barbs white, so that this member presents a peculiarly quaint aspect.

The fur which covers the body of the Pentail is extremely soft in texture, and is of a blackish-brown tint above, fading into a yellowish-

gray beneath. As the tips of the hairs are tinged with a yellow hue, the precise tint of the fur is rather indeterminate, and is changeable, according to the position of the hairs which are exposed to view.

It is presumed that the long tail of the Pentail is used for the purpose of balancing itself in its progress among the branches of trees; but this conjecture is only problematical, as the habits of the animal are not yet known.

The Tupaiadæ are an interesting family of Insectivora in a scientific point of view on account of the presence of several well marked anatomical peculiarities. As already stated the most important of these is the osseous ring that completes the posterior part of the orbit of the eye. In all other specimens of the order Insectivora a communication exists between the orbits and the spaces occupied by the temporal muscles which act upon the lower jaw. In this peculiar conformation of the Tupaiadæ, therefore, we observe an approach to the structure of the insectivorous monkeys. The eyes project sufficiently to enable the animal to see backward almost in a straight line. The small but sharp nails that arm the five toes of the plantigrade feet are sufficiently elevated to be spared from friction against the ground. The name *Tupaia* is given by the natives of Sumatra both to the members of this family and to the squirrels which they so strongly resemble. The fossil remains of the *Omomys* have been found in the Pliocene deposits of the United States.



CHAPTER II.

THE HEDGEHOGS, MOLES AND SHREWS.

THE ERINACEIDÆ—THE HEDGEHOGS—THE GENUS GYMNURA—THE CENTETIDÆ—THE TENREC AND TENDRAC—THE GENUS SOLENODON—THE AGOUTA—THE POTAMOGALIDÆ—THE CHRYSOCHLORIDÆ OR GOLDEN MOLES—THE TALPIDÆ—THE MOLES—THE GENUS TALPA—GENUS CONDYLURA—THE STAR-NOSED MOLES—THE GENUS SCALOPS OR AMERICAN MOLE—THE GENUS MYOGALE—THE DESMANS—THE UROTRICHUS—THE SORICIDÆ OR THE SHREWS.

THE family ERINACEIDÆ is not represented on the American Continent. It consists of *two* genera—one comprising the Hedgehogs proper, the other the Gymnura.

I.—GENUS ERINACEUS.

The HEDGEHOGS are scattered somewhat capriciously over the Eastern Hemisphere. Their most remarkable feature is the coat of stiff-pointed spines covering the back; another is the power of rolling themselves up into a ball, by placing the head on the breast, drawing up the legs, and curling the body round them. When thus rolled up the creature is almost invulnerable, and can with difficulty be unrolled; an enormously developed muscle with a thick margin spreads over the back and sides, and contracts with an immense force, capable of resisting the efforts of its enemies while the spines inflict severe wounds. The only method readily available for making the creature unroll, is to fling it into water.

The spines, which the animal can erect at will, are confined to the back; the other parts of the body are either, like the face and feet, hairless, or covered with hair of a more or less dense character, according to the species. The food of the Hedgehogs consists of insects, worms, snails, and the like.

The LONG-EARED HEDGEHOG, *Erinaceus auritus*, is found in Siberia and the East of Asiatic Russia, and has also been discovered in Egypt. It is smaller than the common European Hedgehog; the limbs are longer and more slender, the hair on the lower surface of the body is extremely fine. The spines on the back do not extend so far as in the European species, and are of peculiar color—the base being white, the centre brown, the tip yellow. The species derives its name from the large size of its ears, which project in such a manner as to produce a very pig-like look.

The HEDGEHOG or URCHIN, *Erinaceus Europæus* (Plate V), is found in every part of Europe, where it is often kept in gardens to kill snails and insects, and in houses to kill cockroaches.

The under surface of the body, together with the limbs, is covered with long bristles and undulating soft hair, which passes rather abruptly into the stiff quills that defend the back, and is so long that it almost conceals the limbs when the animal is walking. The quills cover the entire back and top of the head, and are of a grayish-white color, diversified with a blackish-brown ring near the middle. In the young animal the spines are few in number, soft in texture, and nearly white, so that the little creatures look like balls of white hair or young birds. The young are born not only with the eyes, but with the ears closed also—a fact said to be quite unique. The nest in which they are produced and nurtured is most ingenious in its structure, being so admirably woven of moss and similar substances, and so well thatched with leaves, that it will resist the effects of violent showers.

The Hedgehog is very fond of milk, and is accused by the ignorant peasantry of sucking cows. But it does not despise strong liquor. There is a widespread belief that the easiest way of taming it is by making it drunk; and Dr. Ball, who tried the experiment, found it perfectly successful. He gave some sweetened whiskey to one, and writes of the result: "He did not go far before his potation produced all its effects; he tottered, then fell on his side—he was drunk in the full sense of the word, for he could not even hold by the ground. We could then pull him about, open his mouth, twitch his whiskers, etc.; he was unresisting. There was a strange expression in his face, of that self-confidence which we see in cowards when inspired by drinking.

"We put him away, and in some twelve hours afterward found him running about, and, as was predicted, quite tame, his spines lying so

smoothly and regularly that he could be stroked down the back and handled freely. We turned him into the kitchen to kill cockroaches, and know nothing further of him."

The Hedgehog is the only animal which can eat *Cantharides* flies without inconvenience, and it is quite impervious to most kinds of poison, including that of venomous snakes.

II.—GENUS GYMNURA.

This genus is represented by only *one* species, the BULAU or TIKUS, *Gymnura Rafflesii*, found in Sumatra, and somewhat like our own opossum. All the feet have five toes, the three middle toes being longer than the others. The muzzle is lengthened, but is cut off abruptly at its termination. The eyes are small, and the ears small, rounded, and devoid of hairy covering.

One peculiarity of the animal is, that the fur on the body and head is pierced by a number of very long, bristling hairs, which are much longer on the neck and shoulders. The color is a mixture of black and white, as follows: the greater part of the body, the upper portion of the legs, and the beginning of the tail, are black; while the head, the neck, and flanks, and the remainder of the tail, are white. There is also a black stripe over each eye, which forms a bold contrast with the white fur of the head. It emits a musky odor. Nothing is known of its habits.

THE TENRECS.

The family CENTETIDÆ contains a number of small animals, many of which have a spiny covering. Of the *six* genera into which it is divided, all but one inhabit Madagascar, and the animals are often called MADAGASCAR HEDGEHOGS. In general they may be described as having a long head and pretty long muzzle, small eyes, moderate ears, short legs, with five toes and strong claws, while their coat is like that of the *Gymnura*—half hair, half bristles. The tail is either almost or entirely wanting in five of the genera, while the two species embraced in the genus *Solenodon* are endowed with a very long, bare, and scaly caudal appendage.

I.—GENUS CENTETES.

This genus is subdivided into *two* species, which differ very slightly. The TENREC, *Centetes caudatus* (Plate V), has a slender body, and a long head taking up nearly one-third of the animal's whole length. The ears are short, the eyes small, the neck short and thinner than the body; the hind-legs are slightly longer than the fore-legs. The body is covered with spines, bristles and hairs, which clearly show, by the progressive changes in their structure, that the spines are merely hairs transformed. At the back of the head real spines, not very hard and bending, grow to the length of nearly half an inch. Down the flanks these spines become longer, thinner, softer, and more pliant; and on the back, bristles predominate. The under side of the body is covered with hair, and long, sharp hairs project from the muzzle. The spines, bristles or hairs are of a yellowish color; the former are tipped with black. The Tenrec is not adorned with a tail. It attains a length of eight to ten inches. It cannot coil up into a ball like the hedgehog.

The Tenrec has been carried from Madagascar to the Mauritius and neighboring islands. It is shy and timid, and only comes out at sundown, but never ventures far from its burrow. There is some doubt as to its becoming torpid at certain seasons; the best evidence is to the effect that during the dry season the Tenrec retires to the deepest part of its burrow, and there sleeps from April to November.

Although this creature exhales a musky odor very offensive to most nostrils, the natives regard it as a great delicacy, and the markets on feast days display numbers of Tenrecs in all stages, alive, slaughtered or ready for the spit.

The BANDED TENREC, *Centetes variegatus*, is also a native of Madagascar, and has derived its title of Banded, or Varied, from the bold coloring of the quills and hair.

The color of the back is a blackish-brown, diversified with three bold stripes of yellowish-white. The centre one of these stripes extends along the entire length of the animal, and the two others commence by the ear and terminate by the flank. The hair that covers the under portion of the body is of a yellowish-white color. The generic name, Centetes, is of Greek origin, and signifies "thorny," in allusion to the short and thorn-like spines with which the body is covered.

II.—GENUS HEMICENTETES.

The TENDRAC, *Hemicentetes speciosus*, is smaller than the Tenrec, attaining a length of little more than five or six inches. The color of this animal is rather rich and varied, owing to the deep tinting of the quills and the soft hues of the long and flexible hairs which stud the body intermixed with the quills. The hair is of pale yellow, and the quills are of a deep red or mahogany tint toward their points, and white toward their bases. The long coarse hairs which cover the abdomen and the legs are annulated. This animal is generally found in the neighborhood of water, whether fresh or salt, and makes deep burrows near the bank. The natives esteem it highly as an article of food.

The genera III. ERICALUS, IV. ECHINOPS, and V. ORYZORYCTES, are based on very slight distinctions, and call for no remarks.

VI.—GENUS SOLENODON.

This genus is found only in the Antilles, one species occurring in Cuba, the other in Hayti. We have thus in this genus as compared with the preceding genera, a most remarkable case of discontinuous distribution, two portions of the same family being separated from each other by an extensive continent as well as by a deep ocean.

THE AGOUTA.

The AGOUTA, *Solenodon cubanus*, is one of the few indigenous mammals of the West Indian Islands. Its length of body is about twelve inches, of tail about eight inches. The head, neck, and stomach are of a dirty yellow-ochre color, the tail blue-black, the rest of the coat, black.

This animal is nocturnal and sleeps during the day. Peters accuses it of being guilty of the piece of folly which is usually attributed to the ostrich. When pursued it hides its head, and then stays so quietly that the hunter can seize it by the tail. In captivity it does not refuse food, but requires its meat cut up fine; perfect cleanliness is indispensable for its existence; it seems to take pleasure in plunging into water. Its voice is a grunt, or a scream. When angry its hair stands up. It

catches little animals that come within its reach, and tears them to pieces with its powerful claws just as a hawk tears his victim with his talons.

THE ALMIQUI.

The ALMIQUI, *Solenodon paradoxus*, is peculiar to Hayti. The fur of the Almiqui is long, harsh, and coarse, and its color is an undecided red, tinged with yellow. The nose is elongated, and strengthened at its base by a slender bone, so that it appears to be intended for digging in the earth. The nostrils are placed at the extremity, and divided by a furrow. The cheeks and lips have hairs of very great length; the eyes are small; the ears are moderate, rounded, and almost devoid of hair. The feet are terminated with five toes, and the long claws are curved, and evidently fitted for scraping at the soil.

The tail is moderately long, measuring about nine inches in length, and is rounded throughout, the head and body being rather more than a foot long. The tail is not covered with hair, but is rather naked, and for the greater part of its length is scaly. The lower jaw is somewhat shorter than the upper. The teeth are very peculiar. The two middle incisors of the lower jaw are small and narrow, placed between two long conical ones, which are hollowed on the inside by a deep groove; there are no true canines.

THE OTTER SHREW.

The family POTAMOGALIDÆ consists of *one* genus and *one* species, and is founded on a curious otterlike animal from West Africa, discovered by Du Chaillu at the Gaboon; it has affinities with several groups of Insectivora, but is sufficiently peculiar to require a distinct family for its reception.

The OTTER SHREW, *Potamogale velox*, is thus described: "The head is long and very flat, the nose sharp, eyes very small, ears small and sparingly covered with hair; whiskers stiff, and white-colored, neck thick, body stout, extremities small, feet five-toed, plantigrade behind, tail stout, compressed laterally. Fur short, dense and soft, with coarser hair mixed with the fine fur on the upper part of the body; three-fourths of the tail is covered with very short, bristly and closely applied hairs forming a crest along the upper edge. Color dark-brown on back,

pale-yellow below, almost white on the throat. Length of body fifteen inches; of tail, nine inches.

It is found along the water-courses of clear streams, and hides under rocks waiting for fish. It swims very fast. The great motive-power of the animal seems to be in its tail."

THE GOLDEN MOLES.

The family CHRYSOCHLORIDÆ is divided into *two* genera of very remarkable mole-like animals with a beautiful silky fur of a metallic lustre and changeable golden tints. Their dentition clearly distinguishes them from the true moles. The teeth are separated from each other by an interval equal to their thickness, so that when the jaws are shut, the teeth of one jaw fall into the interstices between the teeth in the other. This is the only known example of such an arrangement. The skeleton, too, has nineteen pairs of ribs. The fore-feet have four toes; the fourth is small, the other three have powerful claws fitted for digging, while the claw of the middle toe is of formidable dimensions. The hind feet are small and five-toed. The eye is invisible, being covered with skin. The limbs are very short, the tail rudimentary, and the snout abruptly truncated. These moles are found in South Africa. The two genera differ chiefly in the lustre of their fur. The first, *Chrysochloris*, has a golden reflection; the second, *Calchochloris*, has a more coppery tinge. The *three* species come from the Cape of Good Hope, Natal, and Mozambique.

The CHANGEABLE MOLE, *Chrysochloris holosericea*, is the most common species, and is distinguished by the long silky texture of its fur.

THE TALPIDÆ OR MOLES.

We now come to a family which comprises many extraordinary forms of small mammalia, especially characteristic of the temperate regions of the Eastern Hemisphere. It is divided into *eight* genera.

I.—GENUS TALPA.

This genus is quite unknown in America, but is exceedingly common in Europe. It forms *seven* species.

The Mole is a burrowing animal, and passes its life underground. Digging with head and paws, it makes a system of communicating passages, which can be traced on the surface of the ground by a slight elevation of soil. These passages radiate from a central dome, which is marked by the mole-hill; to reach it, the animal enters a circular gallery on the same level as the numerous radiating passages; then it passes into one of five conduits, which ascend obliquely toward another circular gallery of a smaller circumference than the first, and placed a little higher; lastly, it enters its dwelling by a passage which opens into the latter gallery. From the floor of this chamber a tunnel runs and connects with some of the radiating galleries.

The body of the Mole is a cylinder terminating in a cone; there is no neck, and the nose is a boring instrument. The eyes are nearly imperceptible. The sense of hearing is very acute; there is no external ear, but the internal ear is highly developed. Its powers of smell, too, are excellent. The tail is very short, the coat black, thick, and silky. Their food is chiefly insects and earth-worms, and the dead bodies of small mammals or birds. The Mole is essentially carnivorous; it does not experience a mere sense of hunger like other animals, but a craving of the most powerful description—a kind of frenzy.

The COMMON MOLE of Europe, *Talpa Europæa*, is, as its name implies, found everywhere in that continent, and is the type of the genus. A species called the BLIND MOLE, *Talpa cæca*, occurs in Italy, and in it the eye is quite invisible, and the snout is somewhat longer than in the common species.

II.—GENUS SCAPTOCHEIRUS.

This genus is represented by *one* species, a recent discovery in Northern China, and calls for no remark.

III.—GENUS CONDYLURA.

This genus consists of only *one* species, which inhabits the Eastern States from Nova Scotia to Pennsylvania. Its most striking characteristic is a peculiar membranous appendage to the snout, which has a star-shaped termination.

The STAR-NOSED MOLE, *Condylura cristata*, (Plate V) is of a dark-brown or blackish color; the tail is long and hairless, and nearly as long as the body without the head.

The most remarkable point in this animal is the muzzle, which is produced into a long, slender proboscis, round the extremity of which are arranged a number of soft, fleshy rays, of a bright rose-color, radiating like the petals of a daisy or the tentacles of a sea-anemone. These curious rays, or "caruncles," as they are more scientifically termed, can be spread or closed at pleasure, and present a strange spectacle when in movement. Their probable object is that they may serve as a delicate organ of touch, to aid the animal in its search for food. The number of these caruncles is about twenty, and the openings of the nostrils are placed in the centre of the star.

IV.—GENUS SCAPANUS.

The *two* species of this genus extend from New York to San Francisco, and are mere varieties of the Scalops.

V.—GENUS SCALOPS.

This genus, which seems to form a link between the MOLES and the SHREWS, is peculiar to North America. East of the Rocky Mountains, it ranges from the Great Lakes to Mexico; but on the Pacific slope it is found only to the north of Oregon.

Its characteristics are an elongated nose, invisible eyes, five toes, armed with large claws and somewhat webbed, and a naked tail. The number of species well defined is *three*, but varieties are numerous.

The COMMON MOLE, *Scalops aquaticus*, (Plate V) has thirty-six teeth, approaching in some points to those of the Rodentia. The eyes are very small, but not covered with skin. The naked tail and webbed feet are white. The body is shapeless; the claws immensely large and strong. The hinder feet and legs are much smaller than the fore ones. The Mole passes the greater portion of its existence below the surface of the ground, and finds a subsistence among the worms and other creatures which it captures during its subterraneous meanderings. The muzzle

of the American is even more remarkable than that of the European Mole, being much longer in proportion to the size of the animal, and is cartilaginous at its extremity. The length of the animal is about seven inches. They come to the surface daily at the hour of noon, and can then be caught by thrusting a spade underneath them. Mr. Peale had a tame one which followed his hand by the scent, and fed freely on fresh meat. It would burrow for amusement in loose earth, and after making a small circle, return to its keeper.

The PRAIRIE MOLE, *Scalops argentatus*, is very similar to the Common Mole, but it is rather larger, and its fur is lead-colored.

The HAIRY-TAILED MOLE, *Scalops Brewerii*, differs by possessing a tail densely covered with hair, a membranous covering over the eye, and large ear openings. In color it resembles the Prairie Mole. Other varieties are the OREGON MOLE, *Scalops Townsendii*, and the BROAD-HANDED MOLE, *Scalops latimanus*.

VI.—GENUS MYOGALE.

The *two* species of this genus are widely separated, one being found in the Pyrenees, the other in Southeast Russia. The animals comprehended in them are specially organized for an aquatic existence. The hind-paws are palmated, and their tail is flattened at a certain portion of its length, in such a manner as to play the part of an oar. Their eyes are very small, and their ears scarcely visible. The body is elongated and covered with silky hair of an iridescent hue. At the base of the tail are numerous glands, which exhale an excessively penetrating odor. The nose is terminated by a small, compressed trunk; the paws are formed of five toes, and are furnished with strong claws.

The PYRENEAN DESMAN, *Myogale pyrenæa*, which the Spaniards call Almizilero, or the "Musky Rat," attains a length of ten inches, of which one-half belongs to the tail. It is chestnut-brown above, brownish-gray on the sides, silver-gray on the belly, white on the snout, the tail dark-brown, with some white hairs. This creature has been found not only in the Pyrenees, but in the Sierra de Gredos, and is probably common to all North Spain.

The RUSSIAN DESMAN, *Myogale moschata*, (Plate V) is nearly twice as long as its Spanish congener. The eyes are small, the auditory

passages thickly covered with hair, the nose is elongated into a proboscis and the nasal aperture can be closed with a small flap.

On account of its aquatic propensities, and the peculiar aspect of its incisor teeth, the Desman was formerly thought to be a rodent animal, and allied to the beavers, among which creatures it was classed under the name of *Castor moschatus*, or Musky Beaver. Its fur is much esteemed on account of its rich color, long silky texture, and warm character. The color of the Russian Desman is brown on the upper portions of the body, becoming darker on the flanks, and fading suddenly into silvery-white on the abdomen. The peculiar warmth of the fur is owing to a thick, inner coating of fine hair beneath the long, silken hairs of the exterior.

The tail of this animal is shorter than the body, and very remarkable in its shape, for at its base it is compressed, but rapidly becomes rounded and swells with such abruptness that it may almost deserve the term of bulbous. It then decreases in size as rapidly as it had increased, and, in proportion as it becomes smaller, it becomes vertically compressed. The entire member is, like that of the beaver, thickly set with scales, through the intervals of which protrude a number of short and bristly isolated hairs.

VII.—GENUS NECTOGALE.

Some specimens of Desman-like animals found in Thibet, have been described by the eminent French naturalist Milne-Edwards, and raised to the dignity of a separate genus, to which he has given the name of Nectogale. They are closely allied to the members of the genus *Myogale*. The remoteness of the locality in which they were discovered seems to have had some influence in suggesting the creation of a new genus, just as the wide separation of the two Desmans has led to the division into two species.

VIII.—GENUS UROTRICHUS.

This genus is represented by a shrew-like mole, which was discovered about twenty years ago in Japan, and a species more recently found in Washington Territory. It seems to form a link, through the *Condylura*, between the Shrews and the Moles.

The JAPANESE MOLE, *Urotrichus talpoides*, has a muzzle prolonged

into a tube which terminates in a naked bulb. The eyes and ears are concealed. The tail is long and hairy; all the feet covered with small plates; the fur is brown.

GLASS' MOLE, *Desmarchus Giletsii*, is the name given to the species found near the White River, Cascade Mountains. It is of a sooty color, and smaller than the Japanese variety. The skull is broader, and narrows anteriorly more abruptly than in *Scalops*; but the specimen examined by Professor Baird was injured and not quite mature, so that he could not make out many of its characteristics.

THE SORICIDÆ OR SHREWS.

This family contains *one* genus, and *sixty-five* species. We content ourselves with a description of the more important species, especially those belonging to our own country.

GENUS SOREX.

The SHREWS offer examples of the smallest animals in the class Mammalia, some species being much smaller than the mouse. Like Moles, they have defective vision; the hair is silky, thick, and varying in color between a gray and a brown; they feed on worms and insects, leading a solitary life in holes, which they seldom leave during the day. They are furnished with glands in the flank which secrete a musky odor. Their bite was for a long time considered poisonous; and our ancestors gave the name to a scolding woman, whom, on account of the venom of her tongue, they called a *shrew*.

The SHREW MOUSE, *Sorex vulgaris*, has a long head and a long and flexible snout; the incisors are extremely long, the lower ones projecting almost horizontally. It is common in all parts of England. A Natural History published in 1658 gives the following quaint account of it:

"It is a ravening beast, feigning itself gentle and tame, but, being touched, it biteth deep, and poysoneth deadly. It beareth a cruel minde, desiring to hurt anything, neither is there any creature that it loveth, or that loveth him, because it is feared of all. The cats, as we have said, do hunt it, and kill it, but they eat not them, for if they do, they consume away and die. They annoy vines, and are seldom taken, except in cold;

they frequent ox-dung, and in the winter time repair to houses, gardens, and stables, where they are taken and killed.

"If they fall into a cart-road, they die, and cannot get forth again, as *Marcellus*, *Nicander*, and *Pliny* affirm. And the reason is given by *Philos.* for being in the same, it is so amazed, and trembleth, as if it were in bands. And for this cause some of the ancients have prescribed the earth of a cart-road to be laid to the biting of this mouse as a remedy thereof. They go very slowly; they are fraudulent, and take their prey by deceit. Many times they gnaw the oxes hoofs in the stable.

"They love the rotten flesh of ravens; and therefore in *France*, when they have killed a raven, they keep it till it stinketh, and then cast it in the places where the Shrew-mice haunt, whereunto they gather in so great a number, that you may kill them with shovels. The *Egyptians*, upon the former opinion of holiness, do bury them when they die. And thus much for the description of this beast."

The WATER SHREW, *Sorex fodiens* (or *Amphisorex Linneanus*), is, as its name implies, found near the banks of streams. It is a good diver, and its ears are admirably adapted to protect it under water, as they are so constructed that the pressure of the water completely closes them.

The ETRUSCAN SHREW, *Sorex Etruscus*, is the smallest of all known mammals. It measures only an inch and a half in length. Its habitat is Italy, but it is said to have been found in Algeria.

The HOUSE SHREW, *Sorex araneus*, is common in Central Europe, but is not found in England. It frequents barns and often enters houses.

THE AMERICAN SHREWS.

FORSTER'S SHREW, *Sorex Forsteri*, is a very well-known species, found in all the Eastern States and quite common in New York. De Kay describes it in the following terms: "Body slender, more elongated and divided at the tip, whiskers long, fur short but fine, feet slender, with five toes; tail four-sided, with a small pencil of hair at the tip, and nearly as long as the body. The color is dark-gray tipped with brown. Length four inches."

The THICK-TAILED SHREW, *Sorex pachyurus*, is found in the Northwestern States. Its fur is longer than that of most Shrews, and gives the creature a stout appearance. The feet and claws are large, the tail

very thick, and all the teeth are chestnut-colored at the tips, like those of a confirmed tobacco-chewer.

The BROAD-NOSED SHREW, *Sorex platyrrhinus*, is one of the smallest quadrupeds on this continent. It is found in the Northeastern States, and a specimen has been captured in Rockland County, N. Y. The ears are large, the tail is almost bare, the color is dark-brown on the back and gray below. Length two inches.

The MASKED SHREW, *Sorex personatus*, allied to the preceding species, is the one called by Audubon *Sorex longirostris*. It is smaller even than the Broad-nosed species.

THOMPSON'S SHREW, *Sorex Thompsoni*, is, however, the smallest Shrew yet described. Professor Baird has seen a specimen weighing less than twenty-two grains. Its color is a dark olive-brown, the ears are large, the incisors fewer than usual.

The NAVIGATOR SHREW, *Sorex navigator*, is characterized by the length of the tail, which is one half longer than the body. The fur, too, is long and very soft and thick; the color is a grayish-brown.

The CAROLINA SHREW, *Sorex talpoides*, is a large species, measuring nearly four inches, with a tail not half an inch in length. The nose and feet are flesh-colored; the rest of the body covered with bright gray fur. It is found in all the Northern States, and as far south as Georgia, being the commonest of all the North American Shrews.

The SHORT-TAILED SHREW, *Sorex brevicaudus*, is the largest of all our Shrews; its fur is leaden in hue, with a slight shade or gloss of purple. The head is broad and obtuse. The tail is about half an inch in length.

CAROLINA SHREW, *Sorex Carolinensis*. This species, though usually known by the same name, is smaller than the species just described as *Sorex talpoides*, and its color is darker; the fore-feet are broader than the hind-feet, and have much longer claws. It is common in the South.

BERLANDIER'S SHREW, *Sorex Berlandieri*, is the most southern species, not passing the Rio Grande. It is small, with a stout body and small ears. Its fur is soft and thick, resembling long-piled velvet.



ORDER IV.

CARNIVORA.

FAMILIES.

- 23. FELIDÆ - - - - - CATS, LIONS, ETC.
- 24. CRYPTOPROCTIDÆ - - - - CRYPTOPROCTA.
- 25. VIVERRIDÆ - - - - - CIVETS.
- 26. PROTELIDÆ - - - - - AARDWOLF.
- 27. HYÆNIDÆ - - - - - HYÆNAS.
- 28. CANIDÆ - - - - - DOGS, FOXES, ETC.
- 29. MUSTELIDÆ - - - - - WEASELS.
- 30. PROCYONIDÆ - - - - - RACCOONS.
- 31. ÆLURIDÆ - - - - - PANDAS.
- 32. URSIDÆ - - - - - BEARS.
- 33. OTARIIDÆ - - - - - EARED SEALS.
- 34. TRICHECIDÆ - - - - - WALRUS.
- 35. PHOCIDÆ - - - - - SEALS.

CARNIVORA

CHAPTER I.

THE CARNIVORA OR FLESH-EATERS—GENERAL CHARACTERISTICS OF THE ORDER—ITS FUNCTION IN THE ECONOMY OF NATURE—ITS GEOGRAPHICAL DISTRIBUTION—ITS DIVISION INTO FAMILIES.

NO division of the Animal Kingdom presents such a variety of forms as the order at which we have now arrived; it embraces the lordly lion and the stealthy weasel, the domestic cat and the faithful dog, the ponderous bear and the unwieldy walrus. Yet these creatures that seem to differ so widely, some of which are fitted to live on the ground, some on trees, some in the waters, are most closely akin.

The title CARNIVORA is derived from two Latin words, *caro*, *carnis*, "flesh," and *voro*, "to devour," and indicates the most striking characteristic of the order. Strictly speaking, no doubt the epithet is applicable to many of the animals which we have described in preceding chapters; but the diet of the bats and shrews is confined to small animals, such as worms and insects, while the CARNIVORA not only possess the appetite for blood, but the strength to gratify it in larger victims. The Carnivorous Quadrupeds are distinguished by the possession of four large and long canine teeth, which can seize and hold fast their struggling prey, and the cheek teeth are either entirely constructed for tearing and cutting or have their crowns more or less blunted; behind the false molars is a large tooth denominated the "lacerator," and it may be remarked that those genera which have the fewest false molars have the shortest, and consequently the most vise-like jaw.

With the exception of the human race and a few of our domestic pets, no animal in a state of nature arrives at old age; that is, at such age as permits decline and feebleness to take the place of strength and vigor. Throughout the whole creation violent death awaits alike all

living things. Do the feeblers animals betray a lack of cunning or a want of speed? The destroyer is at hand; the executioner stands ready. Does the tyrant fail in strength or courage to pursue its prey? The foe awaits it and its doom is fixed. No maudlin pity interferes with this dread duty; no decay, no disease, decline or decrepitude are allowed to sully Nature's works. The agents appointed in the general struggle for existence to destroy and live upon the flesh of their fellow-creatures are the most highly gifted and intelligent of the brute creation, the CARNIVORA; their special function seems to be that of limiting the multiplication of the herbivorous species, and their disappearance from the earth might lead to serious inconvenience.

The Carnivora combine in a very high degree strength and agility; and their appearance, while it may strike terror, does not awaken those feelings of repugnance which many other animals excite. They are usually handsome and graceful, and we find in the order very few of those strange forms which meet us, for example, in the Cheiroptera. They live in all parts of the globe, in mountain and plain, in field and forest, in the North as well as the South, and many of them are nocturnal animals, seeking their prey by night as well as by day. Hence, even if we exclude from our present consideration the marine families of the order, it is difficult to give anything but a very general sketch of their structure.

Their limbs are well-proportioned, and their toes, which are entirely separated from each other, are terminated by stout and strong claws, more or less sharp according to their habits of life; these, with the teeth, constitute their means of attack and defence. In all the members of the cat tribe the claws are retractile, that is, they may be withdrawn into the interior of the paw at the will of the animal. This faculty is owing to the peculiar arrangement of the claws, and the action of a special muscle.

The Carnivora vary very much in their mode of placing their feet on the ground. Some, such as bears and badgers, tread upon the whole surface of the foot, and are remarkable for their thick-set forms, these are called *Plantigrades*; others, as cats and dogs, only touch the ground with their toes, and have a more slender body and a more agile gait,—these are called *Digitigrades*. Between these well-marked types are ranked various species, which more or less partake of both characteristics.

The intelligence of the Carnivora does not contradict their bodily structure; it is the intelligence of beasts of prey, in which cunning and perseverance are combined. The feeling of their strength gives them courage and confidence such as no other creatures possess, but these qualities are accompanied by bad ones; the Carnivora too often display cruelty as well as courage, and some seem to be possessed by a thirst for blood.

One of the most marked features presented by the group of the terrestrial Carnivora is its comparative scarcity in South America, only four families being represented there, not counting the Andean species of the Ursidæ, and both genera and species are few in number. We may therefore, from these considerations alone, conclude that the Carnivora are a development of the Northern Hemisphere. North America is distinguished from Northern Europe and Asia by its possession of at least six species of skunks and the racoons. Another marked feature is the total absence of bears in Southern Africa. The great mass of the generic forms of the Carnivora are found in Asia and Africa.

The marine Carnivora form three families; the terrestrial, ten—the most important of the latter being the Felidæ or cats, the Canidæ or dogs, and the Ursidæ or bears. Between the two former is placed the family of the Viverridæ or civets, connected with the cats by the single genus of the Cryptoproctidæ, and with the dogs by the single genus of the Hyænidæ. Next to the dogs are the Mustelidæ or weasels, which are linked to the Ursidæ by the Procyonidæ or racoons and the Eluridæ. The Ursidæ are followed by the sea-bears or Otariidæ, and then we pass through the walruses or Trichecidæ, to the seals or Phocidæ. The modification of form is not very great, and the occurrence of several families, consisting of but one species, is an indication of a great amount of recent extinction.

THE CATS.

We commence our description of the Carnivora with the family of CATS or FELIDÆ. They are not only the most perfect beasts of prey, but perhaps, with the exception of man, the most perfect of all animals. The common cat may be taken as a type of the family, for in no other family is the fundamental form preserved so closely by all its members; the Lion with his mane, and the Lynx with his tufted ears, are as cat-like as the Leopard; the Cheetah, or Hunting Leopard, alone presents

any important variation, and seems to form a link between the Felidæ and Canidæ. The Cats present a wonderful combination of suppleness, agility, and strength; the head is round, the neck and jaws powerful, and the limbs muscular. The canine and lacerator teeth are large and strong; compared with them the incisors are insignificant, and even the molar teeth, which have ceased to be grinders, appear weak and inconsiderable. The tongue is thick and fleshy, and armed with spines that curve backward. But the teeth are not the only weapons of attack possessed by the cats; they possess in their claws a terrible weapon wherewith to seize their prey or hold the struggling victim while the pointed teeth are doing their work. The foot appears short, because the last joint is curved upwards so that it does not touch the ground, an arrangement which ensures perfect safety to the curved and pointed claws. These claws have an additional safeguard in being retractile, or capable of being withdrawn into a sheath. A little observation of the foot-prints of a cat in comparison with that of a dog will show how complete a protection Nature affords to these powerful and delicate instruments. The cats walk well, but slowly, cautiously, and silently, they can run rapidly, and make springs ten or fifteen times the length of their body. The larger species are too heavy to be good climbers, but the majority are expert in the art. Although they have a repugnance to water, they can swim well, and are exceedingly difficult to drown. The tenacity of life in all species is proverbial.

Their senses of hearing and sight are highly developed; it is the former which guides them on their hunting expeditions. They hear at great distances the lightest footfall, or the gentlest rustle. Their sight, though less developed, is excellent; they probably cannot see far, but see well all that is in their range. In the smaller species the eyeball is contractile; in the bright light of day the aperture of the iris contracts into a mere slit, at night it dilates to a full circle. The whiskers which project on each side of the face seem to be instruments of touch. The cats all seem remarkably sensitive to all external influences, and are very careful to keep their fur clean. Their senses of taste and smell do not seem highly developed; the latter, indeed, is quite subordinate, if we may judge from the delight they exhibit in strong smelling plants, such as *Valerian*.

The Felidæ are found in all parts of the Old and New Worlds, with the exception of Australia and Madagascar. They live in the most

varied localities. Some are found at great heights in mountain regions, others roam over plains or deserts, some haunt the reedy banks of rivers; the most, however, are denizens of the forest, in which the trees afford them a shelter and a vantage ground. They usually avoid the dwellings of man, unless hunger compels them. Then they commence at nightfall to prowl about, or lie in wait near frequented paths for animals or for men. By day they seldom attack. Their food is not confined to any one species of animal; some of them prefer birds, a few eat reptiles, others even catch fish. As a rule they do not disturb the Invertebrata, and prefer prey that they have killed themselves.

All the species of Felidæ attack in the same manner. With silent, cautious tread they creep along, listening and looking in every direction; a rustle attracts their attention, they crouch low and advance up the wind, till they are near enough for a spring. One or two bounds carry them to their victim, a blow on the neck from their frightful paw hurls it to the ground, and the sharp teeth are buried in its throat. Most of the Felidæ have the habit of tormenting their victims, letting them go, then catching them again, and repeating this cruel proceeding till they die from their wounds. It is probable that by a marvellous provision of Nature the sense of pain is driven out of the victim as soon as it is seized or struck by its destroyer. Dr. Livingstone had personal experience of this fact. He writes: "The lion caught my shoulder as he sprang; growling horribly he shook me as a dog shakes a rat. The shock produced a stupor similar to that which seems to be felt by a mouse after the first shake by a cat. It causes a sort of dreaminess in which there was no sense of pain or terror, though I was quite conscious of all that was happening. The shake annihilated fear, and allowed no sense of horror in looking round at the beast."

The family has been made by some naturalists identical with the genus *Felis*, others again divide it into seventeen generic groups. The most convenient arrangement is to regard it as embracing *three* genera, the CATS, the LYNXES, and the HUNTING LEOPARDS



CHAPTER II.

THE LION.

THE AFRICAN LION—THE CAPE LION—THE GAMBIA LION—THE LION OF NORTH AFRICA—THE ASIATIC LION—THE MANELESS LION—THEIR SIZE AND STRENGTH—THEIR ROAR—THEIR HABITS—DIFFERENT OPINIONS OF THEIR CHARACTER—MODES OF DESTROYING—TAME LIONS—DANGEROUS PETS.

WE may premise with regard to the three genera into which the FELIDÆ are divided that the third is distinguished from the first two by having non-retractile claws, and the second from the first by the shortness of its tail, and the possession of pencils of hairs which tuft its ears.

I.—GENUS FELIS.

The true cats are the most beautiful and terrible of animals, and at their head stands that magnificent creature which has been styled from time immemorial the "King of Beasts."

THE LION.

The LION fully justifies by his appearance the royal title which he has received. He carries his head high and walks with an air of stately gravity, his visage is calm and dignified, and bespeaks a confidence in his strength. But his most striking feature is the bushy mane which, in most varieties, overshadows his head and neck, and gives to his remarkable appearance an air of grandeur which commands awe. From the mane alone the home of the lion can be discovered; in the Persian lion it is long and consists of brown and black hair mixed, in the lion of Guzerat it is thin and short; it is most developed in the proudest and most royal variety, the African lion. With the excep-

tion of the mane and a tuft at the end of the tail, the coat of the lion is entirely smooth, and in adult life of a uniform tawny color, while in the cubs it is faintly marked like a tiger or our domestic cat. Owing to this uniform tawny color, the lion is hardly distinguishable from surrounding objects even by daylight, and at night he walks secure. Even skilled hunters, who have heard him lapping water at twenty yards distance, have been unable to make out his form. The female never acquires a mane, and the male does not possess it in its full glory till he is three years old. Some naturalists regard the Cape lion and the Gambia lion as different species, but they do not rise higher than the dignity of varieties. It is amusing to see how national pride influences even the philosophic minds of natural historians. The English regard the specimen of the lion which comes from the British possessions as the type of the heraldic supporter which holds the shield of England, and is famous in our nurseries as having fought with the unicorn. The French writers, on the other hand, sing the praises of the "Monarch of Mount Atlas," and accept with exemplary faith the stories of Jules Gerard. Perhaps no African lion can justly claim to be the old original lion of fable, for there is no doubt that the species was once much more widely distributed than at present, and was not unfrequent in the Southeast of Europe. But as man advanced the lion has receded; when pastoral life succeeded nomad life, flocks and herds were no longer left unguarded to become the prey of any nocturnal prowler, and the lion was driven to seek his sustenance elsewhere or lose his life in the attempt. At present even in Africa the lion is not commonly seen, and in a few generations, as civilization extends over the now unknown interior of that vast continent, it is probable that the lion will be as extinct as the Dodo or the Mammoth, and known only by description. Herodotus tells us that lions attacked the baggage-train of Xerxes in Macedonia, and Aristotle distinctly says that lions are not found in Europe beyond the Achelous, the present Aspropotamo. The Bible mentions the lion as ravaging the herds of Palestine, and it was once as common in Egypt as it is now in Algiers or Morocco.

Some lions have attained the length of ten feet from the muzzle to the root of the tail, and measure four feet in height from the ground to the shoulder. Their strength is prodigious, and with a single blow of the paw they will break the back of a horse; they can leap a space of thirty feet, and can carry off a bullock in their jaws. Nothing can be more

dreadful than the lion preparing for combat; he lashes himself with his tail, his mane becomes erect, and envelops the whole head, his enormous eyebrows half conceal his flashing eyes, while he protrudes claws as long as a man's finger. It has often been doubted whether the end of the lion's tail was armed with a claw as Aristotle described it; but the existence of a strange appendage is demonstrated by Mr. Bennett, who exhibited a claw-like formation taken from the tail of a specimen living in the London Zoological Gardens: it was about a third of an inch in length, solid for the most part, sharp at the apex, and hollowed out at the base.

The roar of the lion has passed into a proverb; when heard within a distance of a mile or two during the silence of the night, it awes all living creatures. Not knowing whence the sound proceeds, they leave their lairs, and in the confusion one or two will probably pass within reach of his spring. Livingstone, however, affirms that the roar of the lion may be mistaken for the cry of the ostrich, and that the voice of the ostrich has never frightened anything. Both Europeans and natives told him that the sounds were indistinguishable, and that the only difference is that one is heard by day, the other by night. Figuiér suggests that the lion of the British possessions may roar "like a sucking-dove," but that the lion of the French colony has a much more powerful voice.

The lioness produces from two to five cubs at a birth, and is a devoted mother, defending them from all aggressors, among whom their majestic father is numbered, for the "King of Beasts," like the Tom cat of our homes, devours his helpless offspring as soon as they come into the world.

As a rule the necessity of procuring food prevents lions from assembling in large numbers, but Livingstone asserts that troops of six or eight have been seen. These were probably two lionesses with their cubs. Delegorgue relates that in winter twenty to thirty lions have been seen to assemble and drive their prey into narrow passes. Five have been seen in the chase of one giraffe, two pulling the victim down, the others waiting close by. These also were probably two females with their families.

Generally the lion does not hunt during the day; not that his eyes are unfitted for diurnal vision, but indolence and prudence keep him at home till evening. When the first shadows of twilight appear, he enters upon his campaign. If there is a pool in the vicinity of his haunt, he places himself in ambush on the edge of it, with the hope of securing a

victim among the antelopes, gazelles, giraffes, zebras, buffaloes, etc., which are led thither to slake their thirst. These animals, well aware of this habit of their enemy, will not approach a pond without extreme caution. If one, however, places itself within reach of their terrible foe, its fate is generally sealed. One enormous bound enables the lion to spring on its back, and one blow with his paw breaks its spine. If the lion misses his aim, he does not endeavor to continue a useless pursuit, well knowing that he cannot compete in speed with the children of the plains. He therefore skulks back into his hiding-place, to lie in ambush until some more fortunate chance presents itself, or complete nightfall shuts out all hope of success.

The audacity of the lion increases in proportion to his requirements. When he has exhausted all means of procuring subsistence, and when he can no longer put off the cravings of hunger, he sets no limit to his aggressions, and will brave every danger rather than perish by famine. In open day he will then proceed to where herds of oxen and sheep pasture, entirely disregarding shepherds and dogs. At such times he has been known to carry his rashness so far as to attack a drove of buffaloes, but the latter can repel him; the bulls forming a ring around the cows and calves, and keeping him off with their horns. Unlike most felines the lion will eat carrion, contrary to the usual opinion that "'tis the royal disposition of the beast, to prey on nothing that doth seem as dead."

The "King of Beasts" seems, like other kings, to have fallen on evil times; not only is he sedulously shot down, but even his character is taken from him. Buffon ascribed to him courage, magnanimity, generosity, nobility, gratitude, and sensibility, and adds that he is so gallant as never to eat till the lioness has satisfied her hunger. More recent observers, however, seem to have arrived at the conclusion that "the lion is a very fox for his valor, and a goose for his discretion." He is not an open foe, he creeps stealthily on his victim, and never attacks large animals. He is accused of indolence, and to this indolence these learned men attribute a bad habit he sometimes acquires of becoming a man-eater. Unarmed, they say, man is weaker of limb, slower of foot, and less vigilant of sense than any wild animal, and is therefore an easy victim. From the moment the lion becomes a man-eater, he is a scourge to the neighborhood, paying, night after night, visits to the village, instead of as usual flying from the presence of man. The lion is exceedingly distrustful; they have been known to surround an escaped horse,

and to prowl round it for two entire days, not daring to attack so apparently defenceless a prey, simply because its bridle was dangling from its neck, and made the creatures suspicious, even though the rein had accidentally been hitched over a stump. On another occasion a lion crept close to a haltered ox, saw the halter, and did not like it, crept away again until he reached a little hillock about three hundred yards away, and there stood and roared all night.

The hunters take advantage of this extreme caution to preserve the game which they have killed. A simple white streamer tied to a stick, is amply sufficient to prevent the lion from approaching. Sometimes, when no streamer can be manufactured, a kind of clapper is substituted, which shakes in the wind, and by the unaccustomed sound, very much alarms the brute. It does truly seem absurd, that so terrible a beast as the lion should be frightened by the fluttering of a white handkerchief, or the clattering of two sticks—devices which would be laughed to scorn by a tomtit of ordinary capacity.

Various means are adopted to destroy lions. The negroes dig a pit, which they roof over with branches that give way at the slightest pressure, on which they place a lamb as a bait. When he has fallen into the pit, his enemies destroy him at leisure. The Arabs adopt a similar device, but sometimes prefer an opposite method; three or four men hide themselves in a hole about three feet deep on the margin of a path frequented by their prey. The roof is covered with heavy stones and earth; narrow openings are made in the sides, in order to see what may be passing without, and on which to rest their fire-arms; lastly, a lure is placed in front of this sanctuary to induce the lion to stop, and when he does a volley of bullets is his welcome. It is rare that he falls dead immediately, he springs towards the ambush, hoping to find the foe; but the construction is too strong to permit him to enter, and he staggers off, probably to die in his den.

At other times, the hunters conceal themselves in a tree, to which they even add more branches in order to make a safe hiding-place. From this post they operate in precisely the same manner as in the subterranean plan.

In South Africa the lion is hunted by dogs, and shot down when he is driven from his hiding-places into the plain. There is another method recommended by Jules Gérard. You must study the lion's habits and movements, and discover his favorite haunts; then you go alone on some



AFRICAN LION

ASIATIC LION

fine night, attack him and kill. This is very easy to say; but it seems to be quite as easy to do, at least for French sportsmen; for M. Chassaing by this method killed fourteen lions in ninety-six hours, four of them falling in one night.

The AFRICAN LION, *Felis leo*, var. *Barbarus* (Plate VI), is a native of the ranges of the Atlas. He is the type of the species, and the CAPE LION and the GAMBIA LION are merely varieties; the former being remarkable for his size and dark mane. One or other of these varieties is found from Algiers to the Cape of Good Hope, and from Senegal to Abyssinia.

As far as is known the ASIATIC LION, *Felis leo*, var. *Persicus* (Plate VI) is very similar in habits to that which inhabits Africa. One variety only, the MANELESS LION, or *Felis leo*, var. *Goojratensis*, deserves special mention; it derives its English name from the scanty nature of its mane.

When first this animal was brought before the notice of naturalists, it was supposed to be merely a young male, whose mane had not yet reached its full development. It is now, however, allowed to be either a distinct species, or a permanent variety. The mane is not altogether absent, as the popular name might give cause to suppose, but is very trifling in comparison with the luxuriant mass of hair which droops over the shoulders of the African lion. The limbs do not appear to be quite so long in proportion as those of the last-named animal, and the tail is shorter, with a more conspicuous tuft. This tuft, by the way, is the readiest point of distinction which separates the lion from the other cats.

We have selected two accounts of a single combat with a lion; the first is from the Cape of Good Hope, the actor a Dutch Boer.

"The Boer had penetrated scarcely fifty yards into the bush when he had reason to suspect that he was close upon the lair of the lion. After remaining silent for several minutes, he saw an indistinctly outlined object moving behind some large, broad-leaved plants. This was the lion, whose head only was clearly visible. The lion was evidently aware that some person had approached, but, after a careful inspection, appeared to be satisfied and laid down behind the shrubs. The Dutchman cocked his rifle, and turned the muzzle slowly round to cover the lion. But even this slight movement was perceived by the lion, who rose to his feet. The Boer fired at a spot between the eyes; the bullet stuck high, but the lion fell over on its back, rising again immediately, and uttering a fierce roar. As he regained his feet, the Boer sent a

second bullet into its shoulder. The lion bounded off through the bush, and the Dutchman went home and sent his servants and dogs to look for the wounded animal, which he concluded would be found dead. Before sunset the hide of the lion was pegged down outside the Boer's house."

It is amusing to contrast this plain narrative, and the Dutchman's prudence in retiring from the field when he knew his enemy was mortally wounded, with the highly-spiced relation of Jules Gérard, who winds up with a hand-to-hand combat.

"The wood, in the middle of which I found myself, was so dense that it was impossible to see for more than eighteen or twenty feet around. I had taken the precaution to assure myself, by the spoor, of the direction the lion had taken when retiring, so as to face that point. Afterward I relieved myself of my turban, the better to hear the slightest noise. At sunset all the animal life in my vicinity was on the move, so that I was often falsely alarmed—at one time by a lynx, at another by a jackal, and sometimes by creatures of less importance. For each alarm I experienced as many fancies; and I may truly say that, in the space of half an hour, I felt as many as would satisfy the most fastidious adventure-hunter. Toward eight o'clock in the evening, at the moment when the new moon half lighted up the edges of the black scud overhead, I heard a branch snap. This time there could be no mistake; only the weight of a large animal could make such a noise. Shortly after, a hollow, suppressed roar re-echoed through the forest. Then I could distinguish a slow heavy tread. With my rifle to my shoulder, elbow on knee, and finger on trigger, I waited the moment when his head would appear. But I could not perceive the foe until he had reached the bull, on which he began to ply his enormous tongue. I aimed at his forehead and fired. The lion fell roaring, then sprang up on his hind-legs, as a horse when rearing. I had also risen, and taking a step to the front fired a second shot at close quarters. This brought him head over heels, as if struck by a thunderbolt. I then withdrew in order to reload; which having done, and seeing that the animal still moved, I advanced on him, dagger in hand. Certain of the spot where his heart was situated, I raised my hand and struck. But at the same moment the fore-arm of the tawny savage made a backward movement, and the blade of my dagger broke in his side. My presence had renewed his vitality. He raised his enormous head. I retired two paces, and administered a final shot. My first

bullet entered about an inch above the left eye and came out behind the neck, but was inefficient to produce death."

The lion, on his part, refuses sometimes to be hunted. One traveler relates that he and his companions one day saw, at two or three hundred yards distance, two large lions, which fled away as soon as they perceived the hunters. The latter pursued them on horseback, shouting loudly; but the lions doubled their pace, and plunged into a wood, where they disappeared.

A wealthy farmer was walking over his land, armed with his gun. Suddenly he saw a lion. Making certain of killing it, he aimed. The gun, however, hung fire; the man, alarmed, turned to the right-about and scampered off with all his might, pursued by the lion. A little mound of stones prevented itself, and on this he jumped, wheeling round to face the brute, and threatening it with the butt-end of his gun. In turn the animal halted, and withdrew some paces, looking very composed, but the farmer did not venture to descend. At last, after nearly half an hour had passed, it slunk slowly away as if it had been stealing; and as soon as it got a short distance off, took to rapid flight.

One more lion story and we have done:

"A Boer, a very humorous fellow, told me that he was returning to his wagons one evening when he was far in the interior; at the time he had with him only the single charge of powder with which his gun was loaded, as he had been out buck-shooting all day.

"Straight in his path he disturbed a lion, which jumped up and turned to look at him. Very naturally his first impulse was to fire, but remembering that he had but that one charge in his gun, he changed his tactics.

"The Dutchmen usually wear large broad-brimmed felt hats, around which several ostrich feathers are fastened. The Boer jumped from his horse and pulled off his hat, which he held with his teeth by the brim, so that the upper part only of his face could be seen above the conglomeration of feathers. He then dropped upon his hands and knees, and commenced crawling toward the lion. Such a strange animal had never before been seen by the astonished *Leonté*, which turned and fled without a moment's hesitation."

Few animals have been the subject of such fables as the lion from time immemorial. The ancient Egyptians knew both the African and Asiatic lion, and knew how to tame them; but it is to the Greeks and

Romans that we owe our stories of the magnanimous nature of the brute, how "the lion knows the true prince," or how

The lion will turn and flee
From a maid in the pride of her purity;

and how an ointment made of a cock and garlic is a certain protection against his attacks. The Romans must have known the lion well from his frequent appearance in the circus. The first fight of lions was exhibited by the *Edile Scævola*. Sulla exhibited one hundred lions, Pompey six hundred, Julius Cæsar four hundred, which fought either with each other or with the gladiators. M. Antony had tame lions; and he and his mistress Cytheris rode the streets in a chariot drawn by a pair. Hanno, the Carthaginian, employed lions to carry his baggage; and tame lions are still sometimes seen in the East.

In 1825 there were, in the menagerie in the Tower of London, two young lions, a male and female; they had been obtained in India, where they were captured when only a few days old, and a goat had been employed to suckle them during the early months of their existence. So docile were they, that they were allowed to wander about the courtyard, and visitors caressed and played with them with impunity. At a later period it was deemed proper to shut them up, to prevent accidents; but this more rigorous captivity did not alter the character of the male. With regard to the female, she became intractable when suckling—a circumstance perfectly explained when we know the violent affection this creature displays toward its progeny.

In menageries, the keepers who look after these ferocious beasts perform every day as great feats as the professional trainers, for they enter the cages and are received by the occupants with much affection—a truly curious interchange of greetings between the man and beast.

There is still preserved the remembrance of a deep friendship which arose between two lions, male and female, brought to the *Jardin des Plantes* in 1790, and a man named Felix, the keeper at that period of the menagerie. When he became unwell, and it was necessary to replace him, the male lion persistently refused to have anything to do with the stranger, and would not even allow him to approach the place of confinement. When Felix reappeared, the lion, accompanied by the lioness, rushed to meet him. They roared with pleasure while licking his face

and hands, and in all their movements demonstrated the greatest joy at seeing him once more.

A lioness has been exhibited in England which would allow her keeper to get upon her back, and, with a still greater degree of familiarity, drag her about by the tail, or even place his head between her teeth.

The following story, however, is a warning to those who intend to indulge in such dangerous pets. A gentleman had a lion cub which was very fond of its master and would play with him like a kitten. One day the gentleman fell asleep, leaving one of his hands hanging over the side of his couch. His pet lion came up to the couch when its master was slumbering, and by way of showing its affection, began to lick the exposed hand. In a very short time the rough, file-like tongue cut through the delicate skin of the hand, and caused some little pain and a slight effusion of blood, which was eagerly licked off by the animal. The pain which was caused by the too affectionate creature awoke its master, who naturally began to withdraw his hand from the caresses of the lion. But at the first movement the lion uttered a short, deep growl, which was repeated in a menacing manner at each attempt to remove the hand from its dangerous and painful position. Seeing that the lion cub had become suddenly transformed from a domestic pet to a wild beast, which had for the first time lapped blood and thirsted for more, its owner quietly slipped his other hand under his pillow, where he kept a ready-loaded pistol, and shot the poor lion through the head. It was an act that went sorely against his will, but was the only course which he could have adopted in such an extremity, when there was no time for reflection, and when the hesitation of a moment might have cost a life.



CHAPTER III

THE TIGER.

THE TIGER—ITS FAVORITE HAUNTS—ITS DESTRUCTIVENESS—TIGER HUNTING—MODES OF KILLING
THE TIGER—TAME TIGERS—THE TIGER IN ANCIENT TIMES.

IF in Africa the lion reigns supreme, in Asia his claims to empire are disputed by an animal which equals him in size, and exceeds him in beauty of fur.

The ROYAL TIGER, *Felis tigris* (Plate VII), stands as high as the lion, but is more slender and lighter built, while the absence of a mane gives it more of the typical cat-look. It is peculiar to Asia, and inhabits Java, Sumatra, a great part of Hindostan, China, and Southern Siberia as far north as the banks of the river Obi; it approaches sometimes the confines of Europe, one having been killed near Tiflis in 1853.

In its color the tiger presents a most beautiful arrangement of markings and contrast of tints. On a bright tawny yellow ground, sundry dark stripes are placed, arranged, as may be seen by the engraving, nearly at right angles with the body or limbs. Some of these stripes are double, but the greater number are single dark streaks. The under parts of the body, the chest, throat, and the long hair which tufts each side of the face, are almost white, and upon these parts the stripes become very obscure. The tail is of a whiter hue than the upper portions of the body, and is decorated with dark rings.

The bright hues of the tiger harmonize admirably with the dusky jungle grass and dark stems of the Eastern forests in which he dwells, and enable him to approach his victims without being perceived, while even skilled hunters have overlooked him when close at their feet. The tiger is met not only in the grassy thickets of the jungle, but also in large, heavily timbered forest lands; but his favorite haunts are the reedy banks of rivers, the impervious bush of bamboos, and such like cane-brakes; he loves above all spots, however, those where the shady



ROYAL BENGAL TIGER

PLATE VII. CARNIVORA.

"korinda" tree grows; the branches of this tree are not merely closely intertwined, but hang on all sides down nearly to the ground, and thus furnish him with concealment from his foes and shelter from the sun. Here he reposes during the heat of the day, and hence he sallies out or springs upon his prey. In the steppes of Siberia he hides in corners of the rocks, or scratches away the snow between the clumps of grass.

The tiger is not exclusively nocturnal in his habits; he is often seen by day, but prefers the twilight hours. In the southern parts of his domain he lies in wait near roads, forest paths, or rivers where he knows that both men and beasts come to drink. In India the holy rivers, to which crowds of votaries go to perform the ceremonies of their religion, supply him with many a victim. In Siberia he is found near the salt-licks, for he knows as well as the hunters do that the game he seeks for can be found there. In Java, where the wild swine are a plague, he keeps their numbers down, but repays himself for any benefit he confers on man by levying contributions on his horses or dogs. He is, in that island, generally found in the same thickets as the peacock. "When the peacocks cry, the tiger is nigh," is a saying of the Dutch colonists; the Javanese natives say the peacock tells the dwellers in the wilderness that the tiger is leaving his lair. The tiger's mode of attack is like that of the lion; the wounds he inflicts are extremely dangerous, for even when they are comparatively slight, lockjaw is apt to supervene; as in the case of wounds from the lion, they are said to open again periodically.

Anecdotes of the monster's strength and audacity are numerous. One attacked a regimental baggage camel and broke its skull with one blow, another is said to have pulled down an elephant. Horses become paralyzed with fear and quiver in every limb when the dreaded foe appears; the very scent of a tiger's presence, or the sight of a dried skin, is sufficient to set them plunging and kicking in their attempts to escape from the dreaded propinquity. One horse, which had been terrified by a tiger, could not afterward endure the sight of any brindled animal whatever, and was only restored to ordinary courage by the ingenious device of his master, who kept a brindled dog in the same stable with the horse until the poor beast became reconciled to the abhorred striped fur.

The buffalo, however, faces him and often slays him. A tiger had sprung on to the neck of a buffalo; the latter rushed with such violence against a tree that the aggressor was hurled to the ground, and before

he recovered consciousness the courageous ruminant had hurled him repeatedly in the air. According to the Tungusians the bear and tiger often fight, and then the latter usually comes off second best. In Hindostan, where many sects of natives reverence the tiger as an incarnation of the destructive powers of Nature, the roads would be impassable in many regions unless for the creature's extraordinary dread of fire; yet hunger drives it to condemn even fire, and an English officer was carried off by one when he was sitting with his companions by the camp-fire. The sentries of troops in the field are often victims. Forbes knew of three well-armed soldiers killed in one night. At the great fair of Hurdwar, where hundreds of thousands of natives assemble, a tiger sprang into the crowd from a thicket and struck a native who was peacefully preparing curry. Another sprang upon an elephant, tore the English sportsman out of the howdah, and plunged with him into the jungle; the man had been rendered senseless by the fall and shock, but was revived by the scratches he received from thorns as the brute carried him away; with great presence of mind he remembered he had a brace of pistols; he drew one, but it missed fire, and the tiger only bit the deeper. A second shot just behind the shoulder-blade was lucky enough to reach the heart; the officer recovered, but was lame for life. The postal service in India is rendered very dangerous by the attacks of these Carnivora; at one ford across the Goomea in Guzerat a letter-carrier was carried off every day for fourteen days, and at Cutcam Sands a tigress stopped all postal communication for several months. But the island of Singapore seems the spot where men are most frequently attacked. Wallace states that there are always tigers near the town, and they kill a Chinaman every day. Another traveler puts the number of Chinese killed annually at four hundred. The Dutch government returned the loss of life by tigers in Java in 1862 at three hundred.

It is a remarkable fact that the tiger is quite a new arrival in Singapore. During the early years of its occupation the beast was never heard of; at present, in spite of all the efforts of the English government, they increase instead of diminishing. New immigrants come from the mainland, and in doing so have to swim a strait fully an English mile wide. The tiger is an admirable swimmer, and never hesitates to pursue its prey in water. A sportsman on Saugor Island came upon a tiger and immediately fled into the river; the tiger followed, and gained rapidly till the man dived and swam some distance under water. When he

reached the surface again the tiger had turned back. Another swam out from the land to a boat and climbed into it; the crew partly jumped overboard, partly locked themselves in the cabin; the tiger sat quietly on the forecastle till he was convinced that his prey had escaped him, when he plunged into the river, reached the bank, shook his coat dry, and disappeared in the jungle. Like the lion, the tiger, when he has once tasted human flesh, becomes a confirmed man-eater; he usually eats only a small portion of his victims; as the Singapore journal remarks: "If he would only eat more, there would be a great saving of human life."

While Europeans regard the tiger as a plague to be extirpated, the Hindoos, as already remarked, regard it as a divinity. Very similar sentiments are held even by the tribes of Eastern Siberia. They call the tiger the "Man-beast," or the "Lord-beast"; they do not like to speak about him, and never mention his proper name. The tribes on the Amoor River designate him by the word they use for God. In the Chinese mountains, hunters who find the tracks of a tiger leave half of their game on the spot to propitiate him; the Tungusians believe whoever kills a tiger will be eaten by one. In Sumatra the natives believe him to be the form assumed by some dead man, and therefore will not hurt him. In addition to the superstitions which thus preserve the tiger, we must remark that in some parts of India he is carefully preserved as game by the princes and rajahs, in spite of the hundreds of lives his maintenance may cost. The English authorities tyrannically interfere with this style of game preserving. In Candeish alone they procured the destruction of one thousand in four years.

In the East the chase of the tiger is an affair of state and conducted with all the elaborate care of a campaign. The Emperor of China sometimes sends thousands of men to the hunt; the King of Oude used to go hunting with more pomp than Louis XIV used to display in making war. He went afield with cavalry, infantry, and artillery, thousands of elephants, an immense train of carts, camels, and beasts of burden. His women accompanied him in covered cars; bayaderes, singing women, jugglers, peddlers, hunting-leopards, hawks, fighting-cocks, doves, and nightingales were carried in the grand procession. With all this preparation only one tiger was slain on the occasion described.

The Indian princes also take their royal game in nets. A series of strong bamboo poles are placed about five or six yards apart, and a strong net stretched between them. The line of nets extends in a circular form

for a considerable distance; the beaters then drive the game into the circle toward a platform where the shooters are stationed. All means imaginable are employed to drive the animals in the proper direction—guns are fired, drums beaten, fires lit; sometimes even the grass is set on fire. The flames, as they hiss and roar, fill the tiger with terror, and soon he is seen stealthily creeping away. He sees the nets; they are too high to leap over, too strong to burst through, the bamboo poles too weak for him to climb up. He is compelled to advance inside the net till he comes within range of the guns of the sportsmen.

The English officials give tiger-hunts on a grand scale. Sometimes as many as forty or fifty elephants are employed. Some bear the sportsmen, some are used to drive the game; an infallible sign of the neighborhood of a tiger is given by the elephant elevating his trunk and trumpeting. The tiger has often been known to pull the hunters from their seats on the elephant.

A very ingenious mode of tiger-killing is employed by the natives of Oude.

They gather a number of the broad leaves of the *prauus* tree, which much resembles the sycamore, and having besmeared them with a kind of bird-lime, they strew them in the animal's way. Let a tiger but put his paw on one of these innocent looking leaves, and his fate is settled. Finding the leaf stick to his paw, he shakes it in order to rid himself of the nuisance; and finding that plan unsuccessful, he endeavors to attain his object by rubbing it against his face, thereby smearing the bird-lime over his nose and eyes, and gluing the eyelids together; then he rolls on the ground, and rubs his head and face on the earth in his efforts to get free. By so doing he only adds fresh bird-lime to his head, body, and limbs, agglutinates his sleek fur together in unsightly tufts, and finishes by hoodwinking himself so thoroughly with leaves and bird-lime, that he lies floundering on the ground, tearing up the earth with his claws, uttering howls of rage and dismay, and exhausted by the impotent struggles in which he has been so long engaged. These cries are a signal to the authors of his misery, who run to the spot armed with guns, bows, and spears, and find no difficulty in dispatching their blind and wearied foe.

Those who have hunted the tiger in a genuinely sportsmanlike manner assert that it is a very cunning animal, and the color of the sportsmen's dress is a matter of some importance. Experience shows

that there is no tint so admirably suited for the purpose as that warm reddish-brown which is assumed by dried leaves.

If a tiger be fairly traced to its ordinary lair, the sportsmen prefer to lie in wait at some convenient point, and either to await the voluntary egress of the quarry, or to send in the beaters and cause the animal to be driven out in the proper direction. When this mode is adopted, it is found best to have, besides those which are held in hand, a whole battery of guns, eight or ten in number, which are laid on the ground, ready loaded and cocked, their muzzles all pointing toward the spot where the tiger is expected to make its appearance. It is so usual an occurrence for two tigers to make their sudden appearance where only one was expected to lie, that the precaution is an absolutely necessary one.

Contrary to the habits of most animals, which take the utmost care of their young, and in their defence will expose themselves to the direst peril, the mother tiger is in the habit of making her young family her pioneers, and when she suspects anything wrong, of sending them forward to clear the way. Knowing this curious propensity, the experienced hunter will not fire upon a cub that shows itself, for the mother will, in most cases, be waiting to see the result of her child's venture. Therefore they permit the cub or cubs to pass with impunity, and reserve their ammunition for the benefit of the mother as she follows her offspring.

Should the tiger not fall to the shot, but bound away, the hunters know whether the wound is a mortal one by inspecting the marks made in the ground by the feet of the retreating animal. It is a curious fact that, however hard a tiger may be hit, yet, if the wound be not a rapidly mortal one, the claws are kept retracted and the foot-prints show no mark of the talons. But should the injury be one which will shortly cause death, the tiger flings out its limbs with the paws spread to their utmost, and at every leap tears up the ground with the protruded talons. A very slight wound causes the death of a tiger; the wound soon becomes inflamed and covered with flies, and the poor beast dies of a swarm of devouring maggots. It is sometimes difficult to tell whether a tiger has been wounded; the loose and movable skin covers the wound as the creature moves away, and checks the effusion of blood. The dead body of the tiger very soon decays, and if the hunters wish to preserve the hide in all its beauty, it must be immediately covered from the sun's rays.

The tigress gives birth to two or three cubs, choosing some sheltered spot for her home. During the first weeks of their existence she never leaves them except when hunger compels; as soon as they are larger she takes them abroad, and then is doubly dangerous and destructive; nothing, however, can exceed her care and loving-kindness for her offspring while they are at the breast.

Tigers, like lions, have been often tamed; we have all seen circus performers enter the cages where they are confined, but in all cases great caution must be exercised in dealing with a creature so treacherous. In the East they have been used for the purposes of the chase. "The Khan of Tartary," writes Marco Polo, "keeps in his city of Cambolu many lions greater than those of Babylon, having beautiful hair and beautiful colors, namely, white, black and red stripes, which he uses to catch wild boars, bears, deers, and other beasts." Some of the Indian fakirs have been seen accompanied by a tiger which followed them like a dog; they are careful to give their favorite no animal food, but feed them on boiled rice and butter.

The Indian princes usually keep tigers for their wild beast fights. A fight in Siam is thus described: "Three elephants, whose heads were defended by a species of armor, were brought into the arena; the tiger was there already, held by two ropes; at the sight of the elephants he tried to escape and crouched down, but received two or three blows from their trunks, which knocked him over. He was then let go; with a terrible roar he sprang at the elephant's head, but it received him on its tusks and flung him high into the air. The tiger fled and tried to clamber over the paling of the circus; failing in his attempt, he laid down and let the elephants beat him with their trunks till the fight was put a stop to."

When he wants to fight, however, the tiger shows vigor and courage enough. One menagerie was the scene of a deadly combat between a lion and a tiger. The two creatures had been put into one large cage or box, which was divided by a partition in the centre, so as to separate the two animals. While the attendants were at their breakfast the tiger battered down the too frail barrier, and leaping into the lion's chamber, entered into fierce combat. Not even the keepers dared interfere to stop the battle, which raged until it was terminated by the slaughter of the lion. The poor beast never had a chance from the beginning, for it was weakened by three years' captivity, and had lost the swift

activity of its wild nature. Its heavy mane defended its head and neck so well that the tiger could not inflict any severe injury on those portions, and the fatal wounds under which it sank were all upon the flanks and abdomen, which were torn open by the tiger's claws. It was a serious loss to the proprietor, for the lion had cost three hundred, and the tiger, which, although the victor, did not escape unscathed, four hundred pounds. The lion was six or seven years of age at the time.

The tiger was not known in Europe so early as the lion. He is not mentioned in the Bible. Nearchus, the famous admiral of Alexander the Great, had seen a tiger-skin, but not the animal itself. A tame tiger was exhibited at Rome about 24 B. C. The Emperor Claudius had four; the Emperor Heliogabalus had four tigers yoked to his chariot to represent Bacchus. Avitus had five killed in the amphitheatre. Nero had a tame tigress named Phœbe, which he used to set at those of his guests who had displeased him.

Tiger, tiger, burning bright
In the forest of the night!
What immortal hand or eye
Could frame thy fearful symmetry?

In what distant deeps or skies
Burnt the ardor of thine eyes?
On what wings dare he aspire—
What the hand dare seize the fire?

And what shoulder, and what art,
Could twist the sinews of thy heart?
And when thy heart began to beat,
What dread hand formed thy dread feet?

What the hammer, what the chain,
In what furnace was thy brain?
Did God smile his work to see?
Did he who made the Lamb make Thee?



CHAPTER IV.

PANTHERS AND LEOPARDS.

THE COUGAR OR AMERICAN PANTHER—THE JAGUAR—ITS DESTRUCTIVENESS—A TAME JAGUAR—
THE AFRICAN LEOPARD—THE ASIATIC LEOPARD OR PANTHER—THE JAPANESE PANTHER—
THE BLACK PANTHER—

LET us pass from the Old World to the New, from the havoc and splendor of the East to the forest of America. We owe an apology to the animal we are now to describe for not placing him next the lion in our series of Carnivora. Many naturalists place him in a sub-genus, for the small, maneless head, the slender body, the absence of stripes or spots, and the round eyeball, are characteristics marked enough to justify a separate division.

THE AMERICAN PANTHER.

The COUGAR or PUMA, *Felis concolor* (Plate IX), bears many names; the Guarani Indians call it Guazara, the Chilians Popi, the Mexicans Mitzli; our hunters and frontiersmen style it the Panther, or more vernacularly the PAINTER. It has the general appearance of a lioness, and attains the length of about four feet and a half on the average. It inhabits Paraguay, Brazil, Guiana, Mexico, and the United States, and is found even in Canada.

The thick, short, and soft fur appears somewhat richer on the belly than on the back, and is of a very dark fawn-color, because the hairs are tipped with black. There is some difference of color between the natives of different regions, those from South America being lighter than those from the United States. The cougar generally prefers thick woods to the open fields, but he is found constantly on the Pampas of Buenos Ayres. His mode of ascending trees differs from that of the jaguar—



OUNCE

CHETAH

ASIATIC LEOPARD

AFRICAN LEOPARD

PLATE VIII. CARNIVORA.

the latter climbs like a cat, the cougar leaps at one spring into the branches. All his movements are light and powerful; he can easily clear a distance of six yards. His eyes are large and tranquil, without any expression of wildness; and although he can see better by night than by day, the sunlight does not dazzle him. His sense of hearing is very sharp, and when hunger calls, his courage is great. All the weaker quadrupeds dread his attacks; even the agile monkeys fall victims to his appetite. He steals, cat-like, up to his prey, and then makes his spring; if he fails, he, unlike the cats, pursues it by long leaps for some distance. A traveler observed one engaged in the chase of a monkey. While he was waiting to get a shot at a Capucin monkey, the whole tribe of apes suddenly set up a terrible scream and took to flight, swinging from bough to bough and tree to tree, betraying at the same time every mark of the wildest terror. A cougar was after them; he took leaps of nearly seven yards from tree to tree, and crept with incredible skill through the climbing plants and intertwined boughs of the Brazilian forest.

When his prey is caught, the cougar bites the throat and sucks the blood, and then eats a portion of the victim, burying the rest in the sand or under leaves. He is very destructive, and hence is everywhere pursued with vigor. The Guachos of the Pampas are expert in destroying him by the lasso or the bolas. One of our own sportsmen said that he always ran away from a grizzly, but that painters were of no account. If the traveler faces round on the animal and looks it steadily in the face, it always retreats. Although the cougar or painter is not an object of personal dread to the settler, he is a pestilent neighbor to the farmer, committing sad havoc among his flocks and herds, and acting with such consummate craft, that it can seldom be arrested in the act of destruction or precluded from achieving it. No less than fifty sheep have fallen victims to the panther in a single night. It is not, however, the lot of every puma to reside in the neighborhood of such easy prey as pigs, sheep, and poultry, and the greater number of these animals are forced to depend for their subsistence on their own success in chasing or surprising the various animals on which they feed. As is the case with the jaguar, the cougar is specially fond of the capybara and the peccary, and makes a meal on many smaller deer than even the latter animal.

The cougar is a good swimmer, and can cross from the mainland to Terra del Fuego, and was seen swimming out to one of the Florida Keys. In Florida, authentic reports tell that children have been carried off by

the rapacious brute from the very fields where their parents were working. It is by no means uncommon in the Adirondacks, and De Kay writes that he remembered the appearance of one of these animals in Westchester County, New York State. It is occasionally seen in the Catskills, and has been shot in Vermont and Massachusetts.

The YAGUARUNDI, *Felis Yaguarundi*, resembles the American panther in being of a uniform color; it is a much smaller animal—not much larger indeed than a cat, but with a more weasel-like body. It extends from Paraguay as far north as Matamoras.

THE LEOPARDS.

The most beautiful members of the whole cat tribe are the graceful and mottled species which are usually grouped together under the name of leopards. They are moderately large creatures, with short, glossy fur marked with spots, but without mane or tail-tuft, with short ears and beautiful, large, round-pupilled, brilliant eyes. They are to be found in both the Old and New Worlds, and their habits and conditions of life are pretty uniform wherever they are found. Most of them possess a talent unknown to either lion or tiger—they can climb trees, not mounting by a bound, but by the aid of their claws, like the common cat. The noblest, the largest, and the most dreaded of all the leopard tribe is the species found in the New World, and with it we will commence our description.

THE JAGUAR.

The JAGUAR, *Felis onca* (Plate IX), has been celebrated by all travelers in South America, and as the cougar has been called the American lion, he has been styled the American tiger. Indeed, as regards size he is not much inferior to the lord of the Indian jungles, and surpasses all the other members of the cat tribe excepting the lion. He is somewhat heavily built, the body is not so long as that of the tiger, and his legs are shorter in proportion; but he, when full grown, measures on an average about five feet from the muzzle to the root of the tail, and stands about three feet high. Humboldt, however, says that he saw jaguars "which in length surpassed all the Indian tigers he had seen in European collections." The tail of the jaguar is comparatively short, averaging a little less than three feet in length. The color of the fur is not quite the same

in all specimens. In general it is of a bright tawny hue; across the breast run two or three bold black streaks; the rest of the body is covered with spots somewhat angular in form, and increasing in size from the head to the tail. These spots have a yellowish-red and black border, and the centre of each displays one or two black points. Along the back runs a line of black spots which in the last third of the tail form rings. A black variety is sometimes found, the spots being still visible, like the pattern in damask.

The jaguar is found from Buenos Ayres and Paraguay through all South America as far as Mexico, and has been seen in the United States as far as the Red River in Texas. It is gradually becoming scarcer. It haunts the wooded banks of streams, the edge of woods, and the bottom lands where the tall grasses grow. During the daytime he sleeps in the shade of the forest or in the long grass of the pampas. The morning and evening twilight is the hour of his exertions, and then no animal comes amiss to him. His strength equals that of the lion or tiger, his eye is sharp and flashing, his hearing excellent, his sense of smell, as in all the cat tribe, only slightly developed. He attacks horses, deer, and tapirs; he has been known to swim across a wide river, to kill a horse, drag it sixty yards to the water-side, then swim across the river with his prey, drag it out of the water, and finally carry it off into a neighboring wood. The natives assert that he has been known to kill one of two horses that were fastened together, and drag off with the dead one the living horse also, in spite of all its struggles.

His powers of climbing like a cat make him a deadly foe to all the monkey race, whom he usually tries to surprise when sleeping; a few sweeps of his paw knock the unfortunate quadrumana from their perch to the ground, whither he then descends to banquet at his leisure. The peccary is seldom attacked openly; this courageous, sharp-tusked creature never hesitates to charge the powerful jaguar, and a herd of peccaries would soon make him repent of his rashness.

It is said that the jaguar kills horses and larger animals in an ingenious manner, which reflects great credit on his understanding. Leaping on the shoulders of the doomed animal, he places one paw on the back of the head, another on the muzzle, and then, by a tremendous wrench, dislocates the neck. His most remarkable feat, however, is the way in which he catches and kills the large turtles. Humboldt relates: "The jaguar follows the turtle to the shore where she lays her eggs; he

attacks her on the sand, and turns her on her back to be devoured at his leisure. The shells are often found quite emptied apparently by the claws, with very little injury to the carapace. We cannot sufficiently admire the power of the jaguar's foot, which clears out the double shells as if the muscular bands had been loosened by a surgical instrument." Hamilton tells a traveler's tale about him: "The jaguar and the alligator are deadly foes; when the jaguar perceives one of these enemies sleeping on a warm sand-bank, he catches him by the under part of the tail, where the soft and most vulnerable parts lie. Usually the alligator is too much astonished to resist or fly; sometimes, however, he drags his aggressor into the water, drowns him, and eats him up." The jaguar can also catch fish. Rengger saw one plunge his paw into the water and bring out a good-sized "dorado." Unlike the cats in general, the jaguar has no dread of fire; he has been known to scare the Indians from their meal, and help himself to the meat on the embers.

Rengger, who landed in Asuncion in Paraguay in 1819, and spent several years there, states that the jaguar is sometimes driven by inundations to enter the cities. He was told when he arrived during the floods at Santa Fé, in 1824, that a few days before a Franciscan monk, who was going to sing morning mass, had been eaten by a jaguar at the door of the sacristy. This story is developed by the "Report of the Mexican Boundary Survey" into a thrilling narrative with four victims, and the scene in Santa Fé of New Mexico.

When the jaguar once tastes human flesh he becomes a confirmed man-eater. It is a comfort to know that he prefers negroes and Indians to white folk; hence a white sportsman has always to provide himself with a negro attendant, if he is going to sleep in the bush.

The jaguar is easily tamed, and young ones are often seen in the houses in Paraguay, where they play with the cats and dogs. Captain Inglefield, of the British navy, had on board his ship a jaguar so tame that he could use its body as a pillow. He never gave it raw meat.

When "Doctor," as it was called, received his daily food, he used to clutch and growl over it like a cat over a mouse, but was sufficiently gentle to permit the meat to be abstracted. It was a very playful animal, and was as mischievous in its sport as any kitten, delighting to find any one who would join in a game of romps, and acting just as a kitten would under similar circumstances. As the animal increased in size and strength, its play began to be rather too rough to be agreeable. and

was, moreover, productive of rather unpleasant consequences to its fellow voyagers. For, as is the custom with all the cat tribe, he delighted in sticking his claws into the clothes of his human acquaintances. This jaguar remembered Captain Inglefield after an absence of two years.

THE LEOPARD AND THE PANTHER.

From the time of Aristotle, the founder of the science of natural history, down to the present day, there have been disputes as to the identity or distinction of the panther and the leopard. From this uncertainty great confusion has arisen, and nothing but the examination of the living animals has enabled modern investigators to finally establish the distinction between the two species. The leopard has a brighter coat than the panther, the spots being further apart and the centre darker, and its tail has only twenty-two vertebræ, while that of the panther has twenty-eight. They have also different habitats; the true panther is found in India and the Indian islands; the leopard is found in Africa. Hence the title "African Panther" is a misnomer in one direction, and "Japan Leopard" in the other.

The LEOPARD, *Felis pardus* (Plate VIII), resembles the jaguar in figure. His total length is over seven feet, including one-third of that length in the tail. The head is large and round, the muzzle slightly prominent, the neck very short, the body powerful, the limbs of moderate length, the paws very large. The ground of his beautiful coat is of a reddish-golden hue, darker on the back, and becoming a light yellow on the throat and belly. Perpendicularly over the upper lip broad black stripes are seen, as well as a large oval spot at the corner of the mouth, and a smaller one over each eye. The rest of his body is covered with black, round or roundish spots, about the size of a walnut. Some of these spots on the shoulders and all those of the back consist of a dark centre surrounded by two crescent-shaped lines, which usually coalesce; on the flanks, where the spots are arranged rather transversely than longitudinally, the centres are surrounded by three or four semicircles.

The leopard is a terrible animal, and will make a bound of forty feet with surprising ease. It keeps by preference in places covered with brushwood, and near streams or arms of the sea. The leopard, perhaps, does not climb on trees; but every day, before commencing his search for prey, he sharpens his claws on a tree, just as our cats do in the carpet

or elsewhere. He never hunts in the middle of the day, but his nocturnal depredations make him as destructive as the lion.

When attacked, the leopard will generally endeavor to slink away, and to escape the observation of its pursuers; but if it is wounded, and finds no mode of eluding its foes, it becomes furious and charges at them with such determinate rage that, unless it falls a victim to a well-aimed shot, it may do fearful damage before it yields up its life. In consequence of the ferocity and courage of the leopard, the native African races make much of those warriors who have been fortunate enough to kill one of these beasts, and the fortunate hunter is permitted to decorate his person with the trophies of his skill and courage. The teeth of the leopard are curiously strung, with beads and wire, into a necklace, and hung about the throat of the warrior, where they contrast finely with their polished whiteness against the dusky hue of the native's brawny chest. The claws are put to similar uses, and the skin is reserved for the purpose of being dressed and made into a cloak, or "kaross," as this article of apparel is popularly termed.

The PANTHER or ASIATIC LEOPARD, *Felis leopardus* (Plate VIII), has equal ferocity, but not the same amount of strength as the African leopard. The spots of the panther differ from those of the leopard by their considerable size, and are formed of five or six black patches grouped around a centre somewhat brighter than the ground color of the coat, and are very appropriately called "rosettes."

The panther ascends trees with agility; into which it pursues monkeys and other climbing animals. It is a ferocious and untamable animal, and inhabits only the wildest forests; not even the tiger is more unconquerable, and its pursuit is proportionably dangerous. It rarely attacks man without being provoked; but it is irritated at the merest trifle, and its anger is manifested by the lightning rapidity of its onset, which invariably results in the speedy death of the imprudent being who has aroused its fury. Its power, nimbleness, and stealth surpass anything that can be imagined.

The JAPANESE PANTHER, *Felis Japonicus* (Plate IX), is merely a variety of the common panther; it differs in having a thicker fur and a bushier tail.

The SUNDA PANTHER, *Felis variegatus*, sometimes called the ASIATIC LEOPARD (Plate VIII), has a small, long head, longish neck, short legs, and a very different coat. The spots are much smaller, darker, and

thicker; the hide thus obtains a black-blue lustre; the ground is dark loam-yellow, so thickly set with dotted spots as to appear almost black.

The BLACK PANTHER, *Felis melas*, which has been sometimes described as a separate species, seems to be merely a variety of the Sunda panther, and is often produced in the same litter as the lighter varieties.

The strength of the panther is marvelous when compared with its size. One of these animals crept by night into the very midst of a caravan, seized two wolf-greyhounds that were fastened to one of the tent pegs, tore up the peg to which they were tethered, and although both the dogs were linked together, and were of that powerful breed which is used for the pursuit of wolves and other fierce game, the panther dragged them clean out of the camp, and carried them for some three hundred yards through dense, thorny underwood.

The panther has a distaste for trees around which there is no underwood; the long grass jungle, which is so favored by the tiger, is in no way suited to the habits of the panther; so that if the hunter seeks for tigers, his best chance of success is by directing his steps to the grass jungles, while, if panthers are the objects of his expedition, he is nearly sure to find them among wooded places where the trees are planted among underwood reaching some seven or eight feet in height.

When a panther is driven to take refuge in a tree, it displays great skill in selecting a spot where it shall be concealed so far as possible from the gazers below, and even when detected, covers its body so well behind the branches, that it is no easy matter to obtain a clear aim at a fatal spot. Its favorite arboreal resting-places are at the junction of the larger limbs with the trunk, or where a large bough gives off several smaller branches. The panther does not take to water so readily as the tiger, and appears to avoid entering a stream unless pressed by hunger or driven into the water by his pursuers. When fairly in the water, however, the panther is a very tolerable swimmer, and can cross even a wide river without difficulty.

The panther has often been tamed, and, indeed, almost domesticated, being permitted to range the house at will, greatly to the consternation of strange visitors.

The OUNCE, *Felis uncia* (Plate VIII), which was once thought to be but a longer-haired variety of the leopard, is now known to be truly a separate species.

In general appearance it bears a very close resemblance to the leopard.

but may be distinguished from that animal by the greater fulness and roughness of its fur, as well as by some variations in the markings with which it is decorated. From the thickness of its furry garment it is supposed to be an inhabitant of more mountainous and colder districts than the leopard. The rosette-like spots which appear on its body are not so sharply defined as those of the leopard; there is a large black spot behind the ears. The spots exhibit a certain tendency to form stripes, and the tail is exceedingly bushy when compared with that of a leopard of equal size. The general color of the body is rather paler than that of the leopard, being a grayish-white, in which a slight yellow tinge is perceptible, and, as is usual with most animals, the upper parts of the body are darker than the lower. In size it is intermediate between the leopard and the panther.

The ounce is an inhabitant of some parts of Asia, and specimens of this fine animal have been brought from the shores of the Persian Gulf. Its home, however, seems to be the central plateau of Thibet, and it occurs not rarely in West Siberia and the Altai range, but is very uncommon in the region of Lake Baikal. The ounce has seldom been seen in captivity. Two living ones were in the Zoological Gardens of Moscow in 1871, but like the other animals in that establishment, they died from neglect.



CHAPTER V.

THE OCELOTS AND THE CATS.

THE MARBLED CAT—THE TIGER CATS—THE COMMON OCELOT—THE PAINTED OCELOT—THE EGRA—THE CHATI—THE LONG-TAILED CAT—THE PAMPAS CAT—THE CLOUDED TIGER—THE COLOCOTS—THE EUROPEAN WILDCAT—THE MANOL—THE DWARF CAT—THE EGYPTIAN CAT—LETTING THE CAT OUT OF THE BAG—THE COMMON CAT—THE MALAY CAT—THE WEASEL CAT—THE SERVAL.

WE now have arrived at the smaller members of the genus, which are usually grouped together under the title of OCELOTS or TIGER CATS. They are all most beautiful creatures, their fur being diversified with brilliant contrasts of a dark spot, streak or dash upon a lighter ground, and their movements graceful and elegant. The link between the panthers and the cats is perhaps to be found in the Marbled Cat.

The MARBLED CAT, *Felis marmoratus*, is about three feet in length, including a foot and a half of tail. The color of its fur is yellow, with a light red shade marked with dark spots. On the forehead and over the top of the head two black stripes run and unite to form one longitudinal band along the spine, which, however, again divides before reaching the tail. Other dark stripes run obliquely from the back of the neck downward; the shoulders are covered with horseshoe-shaped spots, and the limbs are covered thickly with black dots. The ears are short and rounded, externally of a silver-gray color with a black border. The bushy tail is yellowish and ringed.

The Marbled Cat inhabits the mountains of Southeastern Asia, including Borneo and Sumatra. Nothing is known of its habits when wild; in captivity its conduct resembled that of the Ocelot.

THE TIGER CATS.

The OCELOT, *Felis pardalis* (Plate IX), is common in the tropical regions of America, and is found in Texas as far north as the Red River.

In length it rather exceeds four feet, including the tail. Its height averages eighteen inches. The ground color of the fur is a very light grayish-fawn, on which are drawn broken bands of a deep fawn-color, edged with black, running along the line of the body. The band that extends along the spine is unbroken. On the head, neck, and the inside of the limbs the bands are broken up into spots and dashes, which are entirely black, the fawn tint in their centre being merged in the deeper hue; the ears are black, with the exception of a white spot upon the back and near the base of each ear. Owing to the beauty of the fur, the Ocelot skin is in great request, and is extensively employed in the manufacture of various fancy articles of dress or luxury.

In its habits the Ocelot is quick, active, and powerful, proving itself at all points a miniature leopard. It is a good climber; not equal, however, in this respect, to the jaguar; and a good swimmer, but only takes water in the direst extremity. It rarely approaches the settlements of mankind; at the utmost its courage only reaches to the robbing of a hen-roost. It is very shy, and takes to the trees when the dogs come near, but defends itself savagely when brought to bay. In captivity it is lazy and lifeless, learns to play with the domestic cats and dogs, and purrs when stroked.

Of the numerous varieties of these pretty and agile animals, we mention only the most conspicuous.

The GRAY OCELOT, *Felis griseus*, has comparatively light-colored fur, with few, not very distinct spots, and the whole throat an unbroken gray.

The PAINTED OCELOT, *Felis pictus*, is, as befits its name, much more richly varied than the common Ocelot. The black markings of the tail are very deep in color, and the throat has one or two bold black streaks extending toward the shoulders. The spots on the spine are of a deep, velvety black.

The MARQUAY, *Felis tigrinus*, is about the size of the domestic cat. Its soft and beautiful coat is of a fawn-yellow color, with two stripes running along the cheeks, and two others from the corners of the eyes to the neck. Between these, two other stripes make their appearance, and six may be counted on the neck. A long line runs along the back, and on each side are spots either solid or with a bright centre. The ears are black; the tail bushier at the end than at the root.

Waterson had a pet one which had been captured when a kitten: it followed him about, and waged continual war on the rats.



OCELOT

JAPANESE PANTHER

COUGAR

JAGUAR

PLATE IX CARNIVORA

The SYRA, *Felis syra*, resembles the lion and the cougar in being uniform in color. Its body is so long, and its limbs comparatively so short, that it seems to be a link between the cat and the weasel; and it indeed displays the agility of one family and the cruelty of the other. No member of the cat tribe can carry off its booty with greater rapidity than this little marauder. It has never been tamed. Berlandier obtained one at Matamoros, but it seems, like the Yaguarundi, to belong properly to Guiana and Brazil.

The CHATI or MARACAYA, *Felis chati*, is more like the jaguar than the ocelot. It measures about three feet in length of body, and resembles the leopard in the color of its skin, but the spots are disposed irregularly and are of irregular shape. Some are round, some oblong; in places they are in lines, in others scattered without any order. Two black streaks appear on the cheeks and a brown one on the throat; the latter half of the tail has black rings.

It is a courageous beast, and attacks pretty large animals, such as small deer. But like the rest of its kin, it prefers to devastate a well-filled hen-roost, and usually chooses a very dark and stormy night for its visit.

It is easily tamed, and becomes amiable and attached to its owner, but nothing can eradicate its propensity to catch and kill chickens. In Brazil the Indians and negroes eat its flesh but it is said to have a very unpleasant odor.

The LONG-TAILED CAT or KUICHUA, *Felis macrourus*, is about the size of a large cat. It is distinguished from the Chati by a longer tail, a small head, large eyes, pointed ears, and the great curvature of its claws. Its color is reddish-gray, flecked with grayish-brown or black-brown. The back is marked with five longitudinal stripes; on the crown there are two dark stripes with a black spot between them.

It is found nearly everywhere in Brazil, and is hunted for its skin. It is one of the most beautiful of the whole cat group, and is much more agile than the Chati.

The PAMPAS CAT, *Felis pajeros*, resembles the ordinary Wild-cat, but it stands higher, its head is smaller, its tail longer, and its hair stiffer and longer. The color of its coat is silver-gray, on which brownish-red streaks are visible, running obliquely backward and downward from the shoulder, but forming a girdle round the chest, and appearing as rings on the limbs; the tail has four to six dark rings, and is short and bushy.

The male attains the length of three feet. As its name indicates, it is found in the plains of South America, its food being the small rodents that abound there. It is a harmless creature.

The CLOUDED TIGER or RIMAU-DAHAN, *Felis macrocelis*, is marked very irregularly—some spots are oval, some angular; some open, some solid. It has stripes like the tiger, spots like the jaguar, rosettes like the leopard, and black-edged spots like the ocelots. Its color is gray, and it always has two bold, uninterrupted bands of velvety-black running the whole length of its back. The hair is long and very fine, and thus its tail is peculiarly capable of that curious expansion which is familiar to us in the domestic cat. When full grown its body measures about forty inches, its tail about twenty-five.

In spite of its size it is a gentle creature. Two specimens, possessed by Sir Stamford Raffles, were very playful, rolling over on their backs the better to enjoy the caresses of those who would pat or stroke their beautiful soft fur. Nor did they confine their sportful propensities to human companions. One of them, while on board ship, struck up a great friendship for a little dog that was its co-voyager, and used to gambol with its diminutive playfellow in the most considerate manner, taking great care to do no damage through its superior strength and size. While on board, it was fed chiefly on fowls, and generally used to extract a little amusement out of its dinner before it proceeded to the meal. When it received the fowl, it was accustomed to pounce upon the dead bird just as if it had been a living one, and tear it to suck the blood. It would then toss the bird about for hours, just as a cat tosses a mouse, tumbling over it, and jumping about it.

The natives of Sumatra, where it is found, assert that it is by no means a savage animal, and that it generally restricts its depredations to the smaller deer and to birds, including domesticated poultry. The curious name which is given to this animal is of native formation, and has been assigned on account of its arboreal propensities. It spends much of its time upon the tree branches, and lies in wait for its prey, crawling along a bough, with its head resting in the fork of the branches. The word "Dahan," or "Dayan," signifies the forked portion of a bough.

The COLOCOLO, *Felis ferox*, is a small savage creature. Its color is gray, with the exception of the under parts of the body, the throat, and inside of the limbs, which are white. Black streaks, occasionally diversi-

fied with a deep tawny hue, are drawn at intervals over the body and limbs; the legs are of a darker gray than the rest of the body, and the tail is covered with a series of partial black rings, which extend only half way round that member. These black stripes are almost invariably edged with a deep tawny hue, and, on the shoulders, flanks, and thighs, they are entirely tawny. The legs themselves are darker than the rest of the body, being of a very deep gray. In size, the Colocolo equals or surpasses the ocelots, and, to judge from collateral evidence, is a terrible enemy to the animals among which it lives.

A specimen of this creature was shot on the banks of a river in Guiana by an officer of rifles, who stuffed it, and placed the skin to dry on the awning of his boat. As the vessel dropped down the river it passed beneath some trees on which monkeys were perched. Monkeys usually never hesitate to indulge their curiosity, and venture as near as they can to passing boats, but the stuffed skin of the Colocolo was too much for them and they fled in dismay.

THE WILD-CATS.

We must warn our readers that they must go on and consult our next chapter if they wish to learn anything about our native Wild-Cats. Neither the so-called "American Wild-Cat," nor the "Texan Wild-Cat," nor the "Red Cat," are cats at all, but lynxes: such is the perversity of scientific classification. By the true cats, we mean the domestic cat with its varieties, and two wild species from either of which our domestic cat may be a descendant.

The EUROPEAN WILD-CAT, *Felis catus*, has for a long time been regarded as the original form of our household pussy, and this view has still some defenders. But some very striking differences, not to be explained by domestication, exist; one very apparent one is the different shape of the tail. In the domestic cat this appendage is long, slender and tapering; in the wild-cat it is shorter, truncated at the end and bushy. The wild-cat is one-third larger and much stronger than the domestic cat. The hair is stronger, the whiskers more ample, and the teeth stouter and sharper. The color of the creature is pretty uniform, the ground tint of the fur being yellowish or sandy-gray, marked with streaks like the tiger at right angles to the spine. A dark row of spots runs along the back; the tail has numerous black rings and a black tip.

The fur in the colder regions, such as North Germany and parts of Russia, becomes very long and thick.

The wild-cat is not found in Denmark, Sweden or Norway, nor in Northern Russia, where the lynx takes its place. In Germany it inhabits all the well-wooded central mountain regions, such as the Harz, the Thuringian, Bohemian and Black Forests, and the mountains of Upper Hesse. From these head-quarters the wild-cats pass from wood to wood in the plains, and it is probable that they might be found in such localities much oftener than one fancies. In England it is almost extinct, but it still lingers in the North of Scotland and in Ireland, in which last country it bears the name of the "Hunting Cat." It is very common in Southeastern Europe, from the Alps to the Black Sea and the frontiers of Asia. But it does not pass the limits of Europe, and has never been caught south of the Caucasus. It loves dense and lonely forests, especially selecting rocky localities, as the crags and boulders furnish it with safe shelter; it often occupies hollow trees, and does not despise to take up its abode in the hole of the badger or the den of the fox.

At night the wild-cat sallies out on his foray, and any one who has observed the sly, stealthy, silent way in which the common cat hunts birds, can form a good notion of its actions, and judge how it climbs into the nests of the birds, pounces on the hare on its form or the rabbit sporting near its burrow. But it attacks even young fawns, and kills them, leaping on their back and biting the veins of the neck; while it is most destructive to dovescots and hen-roosts, where it kills many more than it can eat. When driven to extremity or wounded the wild-cat is a dangerous foe for dog or man. A German forester tracked one into a hollow tree, and struck the trunk to start it out again. While he was hammering away the cat appeared; before he could raise his gun it was on his back, tore off his thick leathern cap with its claws, and bit through his neckerchief. His cries brought his son to his assistance, but the cat held on to its victim till its head was broken in. In spite of every care the forester died in great agony. An English sportsman who attacked a wild-cat in Scotland, writes: "As soon as I was within six or seven feet of the place, she sprang straight at my face, over the dogs' heads. Had I not struck her in mid-air as she leaped at me, I should probably have got some severe wound. As it was, she fell with her back half broken amongst the dogs, who, with my assistance, dispatched her.

I never saw an animal fight so desperately, or one which was so difficult to kill. If a tame cat has nine lives, a wild-cat must have a dozen."

The MANUL, *Felis manul*, is a Siberian wild-cat, somewhat lower than the European one in stature, and clad in a very thick coat of yellowish and dark-brown hair growing out of a close gray fell. It is found on the North of the mountainous border of Central Asia, exclusively on the steppes. It is mentioned here because some naturalists perhaps justly regard it as the original of the Angora cat.

THE MALAY CAT.

The MALAY CAT or KUWUK, *Felis Javanensis* (Plate XI), is of a grayish-brown color with dark black bands. During the day it hides in hollow trees, sallying out to plunder by night. The natives describe it as very sagacious, but fierce and untamable; they affirm that, in order to approach fowls unsuspected, it imitates their voices.

The CHINESE CAT, *Felis undatus* (Plate XI), is a dwarf variety, reaching a length of barely two feet, including tail. Its color is a brownish-gray, and four longitudinal stripes, two over the eyes, two on each side of the nose are very conspicuous. The stripes from the eyes turn toward the shoulders; those from the nose run along the back on each side of a row of oblong spots; the flanks are covered with small round spots which extend also over the tail.

This dwarf cat is found in India, the Sunda Islands and Japan, and in China is the representative of the wild-cat. It is one of the wildest and bloodiest species of the family, and resists all attempts at taming.

THE DOMESTIC CAT.

There seems to be little doubt that we must regard as the ancestor of our household cat, the Nubian Cat, which, in the hoariest antiquity, all Egypt revered, worshipped and embalmed. While other animals were worshipped locally, the cats were deemed holy everywhere. If a house took fire, the cat was the first thing saved; if a cat died, the Egyptians went into mourning; whoever purposely or accidentally killed one was put to death; not even the name of a Roman citizen could save the offender. The bodies of the cats were carefully embalmed and placed in the tomb, and they are still the most common mummies found in the sepulchres.

The Goddess Pacht or Bast who is represented with a cat's head, had her shrine at Bubastis in the Delta, and there most of the cats were taken to be buried. Pacht seems to have been the goddess who presided over birth and infancy, and to have represented some of the attributes of the Phœnician Astarte.

In German mythology the cat appears as the beast of the goddess Freia who drove about drawn by a team of cats; hence when the religion of our fathers gave way to Christianity the cat became the associate of witches in popular superstition, and lingering reminiscences of its sacred character have given rise to the belief still held by most of us, that "who ever drowns a cat will be unlucky for seven years." The cruel practice of throwing from the church tower cats with bladders tied to their feet is said to have arisen at Ypres, and was regarded as a sign that the people had thrown off heathenism; it was a mockery of Freia's team. The proverb of "letting the cat out of the bag" has a curious history. According to tradition the Ring of the Nibelungs had the power of always replenishing a hoarded treasure: of course such a ring was a most desirable acquisition, and if the ring could not be procured, was there any substitute? The substitute was called the "Broodpenny," and was a coin which could be procured in this fashion: on the longest night of the year take a black cat and put it in a bag, and tie the bag tight with ninety and nine knots; then go to the church and walk three times round the church, taking care every time you pass the door to put your mouth to the key-hole, and call for the sexton. On the third summons the sexton—of course old Nick—appears; you ask him if he would like to buy a hare; he offers and you accept a dollar for your bag and its contents. You must then do your very best running, while the purchaser is untying the ninety and nine knots, for when they are all untied, the cat is out of the bag, and there is the very devil to pay.

The cat was undoubtedly first tamed by the Egyptians; the Greeks and Romans make very slight mention of them. In the tenth century the laws of the Welsh prince Howell Da, fixed the prices of cats of all ages, and it was decreed that whosoever killed the king's cat should pay as a fine such an amount of wheat as was necessary to cover the cat entirely when held by the tail with its nose on the ground.

The EGYPTIAN CAT, *Felis maniculatus*, was found by Ruppell on the west side of the Nile, in a district where rocks and bush alternate; it has since been seen in Abyssinia, the Soudan and the interior of Africa. Its



CHINESE CAT
MALAY CAT
COMMON CAT WITH KITTENS

length is about twenty inches, its tail about ten. Its color is a dull-yellow or gray, reddish on the head and back, lighter on the sides, the hind-legs are marked with stripes, and some narrow lines appear on the forehead. Brehm in vain sought to tame a grown up one, but two young ones in the Zoological Gardens of London seemed peacefully inclined, and the eminent traveler Schweinfurth found that among the Njam-njams of Central Africa, the *Felis maniculatus* did the mouse-catching of their households. There can be little doubt, then, that this is the species which the ancient Egyptians undertook to tame. The mummies of cats from the earliest monuments of that extraordinary people prove that very little change has been effected in the animal by domestication.

The descendants of the Egyptian cat are found as household pets in all countries of Europe, in India, Japan and China, in which last empire it is used to tell the time of day by the size of the pupil of its eyes. In Modern Egypt it is still regarded with affection as the favorite animal of Mohammed, and funds exist the interest of which is devoted to feeding cats. In South America it is not found in the Andes, as it cannot endure the cold and thin air of the mountains; in New Zealand it has relapsed into a wild state, and is hunted by the settlers as zealously as they hunt its wild congeners. In the North of Asia it is an article of commerce, the Mantchoos do a large trade in it, selling kittens for sable skins to the neighboring tribes, but it is not found among the Nomad tribes of Eastern Siberia. Whenever the population quits a roving for a settled life the cat makes its appearance; it was introduced into the regions at the mouth of the Amoor in 1853, and by 1857 had reached the settlements half-way up that stream. The Danish ladies carried cats with them to Greenland. In North America it is in every household.

The cat is thus a living witness of the progress of mankind, of settled life and incipient civilization. Yet under all circumstances the cat asserts its independence, and submits to man only as far as it chooses. If cared for, it becomes attached to the family; if neglected, it becomes attached to the house. We are too frequently in the habit of ascribing to the cat treachery and want of affection, as well as of undervaluing its intelligence; we apply to it the same epithets that a dominant race always applies to a weaker one when it obstinately refuses to resign its independence, and sink into contented slavery. The cat refuses to be our slave or lick the hand that flogs it; and it will not place its qualities unreservedly at

our disposal. As far as mere brain power is concerned it is higher than the dog. Gratiolet, who has classed all the mammalia in groups according to the development of the brain, places the cats in the class above that to which he assigns the dog.

The DOMESTIC CAT, *Felis domesticus* (Plate XI), appears in various colors. We have them white, black, almost always with a white spot on the breast, yellow, bluish-gray, gray with dark stripes, and the so-called tortoiseshell cats in whose coats three colors combine. We may remark as a curious fact that all white cats with blue eyes are deaf, and that all tortoiseshell cats are females.

There are few varieties of the cat; two only deserve mention here.

The ANGOLA Cat, *Felis domesticus angolensis*, is distinguished by its size, its long silky hair, and its flesh-colored lips and soles. Pallas regards it as descended from the Manul (p. 211). It is generally of a uniform color, and is a very handsome creature. It is very lazy, and prefers being supported for its beauty to working for a living.

The MANX CAT, *Felis domesticus caudatus*, has the hind-legs disproportionately developed, and is remarkable for the want of a tail, the absence of which member is only indicated by a rather wide protuberance. This want of the usual caudal appendage is most conspicuous when the animal, after the manner of domestic cats, clambers on the tops of houses, and walks along the parapets. How this singular variation of form came to be perpetuated is extremely doubtful, and at present is an enigma to which a correct answer has yet to be given. It is by no means a pretty animal, for it has an unpleasant weird-like aspect about it, and by reason of its tailless condition is wanting in that undulating grace of movement which is so fascinating in the feline race. A black Manx cat, with its glaring eyes and its stump of a tail, is a most unearthly apparition.

We need not burden our pages with anecdotes of cats, nor endeavor to refute the ignorant belief that they can perform the impossible feat of sucking an infant's breath. We may, however, add a few lines on two points.

The extraordinary electrical character of the Cat is well known. On a cold, bright day, if a cat be stroked, the hairs of the fur bristle up, and electrical sparks issue therefrom, accompanied with a slight crackling.

It appears, too, that the animal may be so surcharged with electricity that it will give a severe shock to the holder. In order to obtain this

result, the cat should be placed on the knees, and one hand applied to its breast while the other is employed in stroking its fur. Cracklings and sparkles soon make their appearance, and in a short time, if the party continues to stroke the animal, he will receive a sharp electrical shock that may be felt above the wrists. The cat seems to suffer as much as the experimenter, for on giving forth the shock she springs to the ground in terror, and seldom will permit a repetition of the same process.

The other point is the "homeing" power of the cat. No difficulties or dangers seem to prevent it from finding its way home, even from a considerable distance and under circumstances which would cause any other animal to fail. Eighteen cats, belonging to different persons, were put in baskets and carried by night to a distance of three miles, when they were set at liberty at a given moment. A wager was laid upon them, and the cat that got home first was to be the winner. One of the animals arrived at its residence within an hour, and carried off the prize. Three only delayed their arrival until the next morning.

Whether the cat can ever be used, like the carrier-pigeon, to carry intelligence in time of war through the enemy's lines, remains to be seen.

THE MARTEN CAT AND SERVAL.

Before we pass to the next genera two other species of cats must be mentioned, one a link between the cats and civets, the other between the cats and lynxes.

The MARTEN CAT, *Felis viverrinus*, attains the length of three feet, ten inches of which must be reckoned to the tail. It is longer and lower than the ordinary cat, and has a smaller head. It is found in the East Indies and the adjacent islands as far as Formosa.

The SERVAL, *Felis serval*, is commonly called by the Dutch colonists of the Cape the "Bush cat." It is a very pretty animal, and on account of the bold variegations of its fur, its skin is in great request, and finds a ready sale among furriers, who know it by the name of the Tiger-cat.

The ground color of the Serval's fur is of a bright golden tint, sobered with a wash of gray. The under portions of the body and the inside of the limbs are nearly white. Upon this ground are placed numerous dark spots, which occasionally coalesce and form stripes. In number and size they are very variable. The ears are black, with a broad white band

across them, and from their width at the base, they give the animal a very quaint aspect when it stands with its head erect.

In disposition, the Serval appears to be singularly docile, and even more playful than the generality of the sportive tribe of cats. It is not a very large animal, measuring about eighteen inches in height, and two feet in length, exclusive of the tail, which is ten inches long, and covered with thick, bushy fur. the body is slender, but stands high, the head is long, the ears remarkably large, the eye small and placed obliquely.

According to Mr. Anderson some of the African tribes believe that the real Tiger exists in their country, but they evidently refer to the Serval. When attacked the Serval displays great ferocity. the traveler just mentioned had one of his best and strongest dogs nearly killed by a Serval. On being discovered the beast took refuge in a tree, and was not dispatched before it had received sixteen wounds, some of the arrows employed for the purpose having been poisoned.



CHAPTER VI.

THE LYNXES AND CHEETAHS.

THE GENUS LYNX—THE PERSIAN LYNX—THE CARACAL—THE EUROPEAN LYNX—THE BOOTED LYNX—THE CANADIAN LYNX—THE AMERICAN WILD-CATS—THE GENUS GEPARDUS—THE CHEETAH OR HUNTING LEOPARD.

ALMOST all naturalists now place the lynx in a separate genus from the cats proper, although in common parlance many lynxes are called cats. In our family of the Felidæ the Lynxes form the second genus.

II.—GENUS LYNX.

The Lynxes are characterized by a large head with tufted ears, a powerful body on long legs, and usually a short tail. All quarters of the globe, except Australia, are blest with Lynxes. They haunt dense, almost impassable forests and thickets, but are found also in steppes and deserts; they may be regarded as highly developed cats, and are as rapacious as any leopard, and must be classed among the creatures which do more harm than good. Dr. Gray classes together as a genus two small lynxes in which the ear tufts are not developed and the tail hangs down to the heel. One of them is an African, the other an Indian animal, which we prefer to regard as species only.

THE PERSIAN LYNX.

The PERSIAN or MARSH LYNX, *Lynx chaus* (Plate X), our first example of the Lyncine group, is not unlike the lion in the general tawny hue of its fur, but is extremely variable both in the depth of tint and in certain indistinct markings which prevail upon the body, limbs, and tail. The fur, however, is always more grizzled than that of the lion, and there seem to be in almost every individual certain faint stripes upon the legs

and tail, together with a few obscure stripes or dashes of a darker color upon the body.

Along the back, the hue is deeper than on the sides, and on the under parts of the body the fur is of a very pale tint. The extremity of the tail is black. The markings which are found on this animal are caused by the black extremities of some of the hairs. When these black-tipped hairs are scattered, they produce the grizzly aspect which has been mentioned as belonging to this animal, but when they occur in close proximity to each other, they produce either spots, streaks, or dashes, according to their number and arrangement. On the tail, however, they always seem to gather into rings, and on the legs into stripes. There is an undercoating of soft woolly hair through which the longer hairs stick up.

The Chaus is found in Eastern and Southern Africa, Persia and India. It frequents, as its name indicates, marshy ground; its food consists chiefly of the smaller quadrupeds and birds, but it is also fond of fish, which it catches very adroitly by a sweep of its paw.

The Chaus was known to the ancient Egyptians, who embalmed and entombed it as they did the cat, and some authorities even incline to regard it as the ancestor of the cat.

THE CARACAL.

The CARACAL, *Lynx melanotis* (Plate X), is distinguished by a slender body, long legs, narrow pointed ears with black tufts. Both its common and its scientific titles, the Turkish *cara-cal*, and the Greek *melan-otis*, mean "black-eared." It is widely extended, being found in Africa, Asia Minor, and India; it avoids woodlands, and prefers the steppes and deserts, where it lives usually on small birds and animals; sometimes, however, it attacks the lesser kinds of antelopes. Its color is pale-brown, warmed with a tinge of red, varying slightly in different individuals. The under parts of the body are paler than the upper, and slightly be sprinkled with spots. The color of these spots is very variable, for in some individuals they are nearly black, while in others they are a reddish-chestnut. The lower lip, the tip of the upper lip, and the chin are quite white. The tail is very short. It is not a very large animal, being about equal to a rather large bull-terrier dog in size, but very much more active.



RED SKIN LYNX

CANADIAN LYNX

CARACAL

BAY LYNX OR COMMON WILD CAT

PLATE X CARNIVORA

It is a peculiarly ferocious and surly animal, wearing a perpetual expression of malevolence, and always appearing to be, as it truly is, ready for a snarl and a bite.

It is said to hunt in packs occasionally like wolves or wild dogs, and it possesses very great strength in comparison to its size, being capable at the same time of making surprising springs and of climbing trees.

THE EUROPEAN LYNX.

The COMMON LYNX, *Lynx vulgaris*, has a strong beard and a short rudimentary tail. A full-grown lynx attains the length of three feet, or even three and a half feet, the tail measuring six to eight inches. The animal has a very powerful, compact figure, strong limbs, paws resembling those of the leopard, long ears ending in black hairs an inch and a quarter long. The fur is thick and soft, forming on the face a white beard which hangs down in two points; its color is usually reddish-gray and grayish-brown mixed, and marked on the head, neck and back with darker spots; the inside of the ear is white. The tail is thickly covered with hair, and the latter half is black. Its coat is shorter in summer and reddish in hue, but becomes longer and whiter in winter. The varieties of color are very numerous; indeed, scarcely two individuals are precisely alike.

However common this animal may have been in the Middle Ages, it is now comparatively rare; and Brehm states that the last lynx in Germany was killed in 1846. It is found, however, in Hungary and Russia, and is represented by a kindred species in the South of Europe.

The lynx was known to the ancients; the Greeks consecrated it to Bacchus, and Pliny has placed to its credit several absurd stories. Among others, he endows it with the faculty of seeing through walls; hence the expression *Lynx-eyed*, which is adopted in our language to designate very keen vision.

This animal resembles the caracal in its habits and mode of obtaining prey. Sheep often fall victims to the lynx, but it finds its chief nourishment among hares, rabbits, and other small animals. Like the caracal it is an excellent climber of trees, and chases its prey among the branches with ease and success.

The fur of the lynx is valuable for the purposes to which the feline skin is usually destined, and commands a fair price in the market. There

who hunt the lynx for the purpose of obtaining its fur, choose the winter months for the time of their operations, as during the cold season the lynx possesses a richer and a warmer fur than is found upon it during the warm summer months.

The SOUTHERN LYNX, *Lynx pardinus*, is a smaller but more beautiful animal, found in Spain and Portugal. Its fur is of a ruddy chestnut color, with black spots and stripes, and from these leopard-like markings it derives its scientific appellation. Its flesh is regarded in Spain as a great delicacy; it is beautifully white and tastes like veal. Madrid receives yearly about three hundred lynx-skins, which are made into caps much admired by gipsies, stableboys, and bull-fighters. The name of "Loup-cervier," sometimes given to it, probably originated from its howling like a wolf during the night. It nimbly climbs trees in pursuit of prey. Martens, ermines, hares, and rabbits also enter into its alimentation. It does not, however, eat the flesh of large victims, unless its hunger is extreme; but generally is satisfied by sucking out the brain.

Taken young, it becomes accustomed to captivity, and is fond of being caressed; but it will return to its wild life if opportunity offers, so really never becomes attached to its master. It is an extremely cleanly animal, and like the cat, passes a large portion of its time in washing and cleansing its fur.

THE BOOTED LYNX.

The BOOTED LYNX, *Lynx caligatus*, derives its name from the appearance of its hind-legs, which are covered with black hair. The general tint of the fur is gray, plentifully besprinkled with black hairs. It is found in the southern parts of India and the greater part of Africa, from Egypt and Morocco to the Cape. It is very probable that the Booted Lynx is not a species, but only a variety of the Persian Lynx.

THE CANADIAN LYNX.

The POLAR or CANADIAN LYNX, *Lynx Canadensis* (Plate X), is called by the French Canadians *Le Chat* or *Peshoo*. It is the largest of the American lynxes, and sometimes attains the length of four feet, including the tail. It is one of the most important fur-bearing animals of the continent; the hair is longer and thicker than in the European lynxes, the

beard and ear-tufts are more developed, and each hair is of two colors. A brownish silver-gray is the prevailing hue, marked on the flanks very indistinctly with spots; in some specimens the fur takes a slight chestnut tinge. The ears are edged with white. But it is probable that considerable changes of the coat take place according to the season of the year.

When running at speed it presents a singular appearance, as it progresses by a series of bounds, with the back arched and all the feet coming to the ground nearly at the same time. It is a good swimmer, being able to cross the water for a distance of two miles or more. Powerful though it be, it is easily killed by a blow on the back, a slight stick being sufficient weapon wherewith to destroy the animal. The flesh of the Peeshoo is eaten by the natives, and is said, though devoid of flavor, to be agreeably tender. It is not so prolific as the generality of the feline tribe, as the number of its young seldom exceeds two, and it only breeds once in the year. The range of this animal is as far south as the Great Lakes and eastward to the Rocky Mountains, but it is not uncommon in Northern New York. It frequents wooded regions, and in its manner of life differs in no respect from the other lynxes. Some authors describe it as a timid animal easy to destroy, but Audubon calls it a strong, bold creature, which can take good care of its hide. Audubon writes; "The Canada lynx is more retired in its habits than our common wild-cat, keeping far from the habitations of settlers. Its fine, long fur enables it to withstand the cold of our northern latitudes. When alarmed, it leaps or bounds rapidly in a straight direction, and if hard pressed, takes to the trees, which it climbs by the aid of its powerful fore-legs and claws. It swims well, and will cross the arm of a lake two miles wide." He adds: "The stories told of the great cunning of this species in throwing mosses from the trees in order to entice the deer to feed on them, and then dropping on their backs, may be omitted as requiring no refutation." He evidently discredits the common belief to which we have referred above that this lynx "is easily destroyed by a blow on the back with a slender stick."

The food of the Canada lynx consists of grouse and other birds, hares, rabbits, squirrels, the Arctic fox, and the lemming. It is said to pounce on the wild goose at its breeding-places, and Audubon heard with skepticism an account of its having killed a deer, but confirms the statement that it kills young fawns.

THE AMERICAN WILD-CATS.

The so-called wild-cats consist of three small species of lynxes which are somewhat difficult to distinguish. Baird writes: "In the study of the North American lynxes I have found it very difficult to come to satisfactory conclusions, owing to the imperfect condition of some specimens and the uncertainty as to date of collecting others. Northern skins of wild-cats have generally longer and softer hair the year through than the southern, while, as in the deer, the hair will have a reddish or bay tinge, which is replaced by grayish in winter. As a general rule, the further south we go the smaller the species. There appear to be at least *three* species of smaller American lynxes in North America—the Common Bay Lynx, which reaches from the Atlantic to the Pacific throughout nearly the whole latitude of the United States, but is replaced in Texas and Southern California by the *Lynx maculatus* (Texas Wild-cat), and in Northern Oregon and Washington Territory by the *Lynx fasciatus* (Red Cat). The precise limit of the last mentioned species, other than as indicated, has not been ascertained."

Audubon regards the two latter species as merely varieties of the common wild-cat.

THE WILD-CAT OR BAY LYNX.

The WILD-CAT OR BAY LYNX, *Lynx rufus* (Plate X), is described as follows: "The fur moderately full and soft, above and on the sides pale rufous overlaid with grayish—the latter color most prevalent in winter—a few obsolete dark spots on the sides, and indistinct longitudinal lines along the middle of the back; color on the throat like the sides but much paler; beneath, white spotted; inside of the legs, banded; tail, with a black patch at the end with indistinct subterminal half-rings; inner surface of ear with a white patch." Length of head and body twenty-seven inches; tail, seven inches; height at shoulder, fifteen inches. The Bay Lynx is fond of swampy situations, and is abundant in the cane-brakes of the Southern States, where at times they have become a great nuisance by the havoc they make among the poultry. It is generally cowardly when attacked, and always flies from its pursuers; and Audubon says that he always found it very timid, and unwilling to attack anything larger than a hare or a young pig. Dr. Coleman witnessed a fight be-

tween an eagle and a wild-cat. After a fierce struggle, in which the eagle was so badly wounded that he could not fly, the cat, badly scratched and having one eye gouged out, was found lying dead.

In parts where their destruction is necessary, the wild-cats are hunted by dogs or caught in traps, and if a cat is "treed," the hunters shake it off as they would a racoon. These cats hunt just like common cats, and mew and purr in the same way. They are not good swimmers, but are not averse to taking to water.

Audubon tried to domesticate a young wild-cat; it showed, however, no disposition to improve its habits and manners, but became daily more wild and vicious.

THE TEXAS WILD-CAT.

The TEXAS WILD-CAT, *Lynx maculatus*. We quote again from Baird: "Fur short and rather coarse, color light reddish-brown overlaid with gray in winter, quite distinct darker spots on back and sides; color on throat paler than on sides; beneath, white spotted; inside of legs, banded; black patch at end of tail; inner surface of ear black, with a white patch; an obscure dark line runs on each side of the neck, with two round, black spots between their extremities; the ears large and pointed." Length from nose to root of tail, three feet; tail, six and a half inches. This variety is found in Mexico, Texas, and California.

THE RED CAT.

The RED CAT, *Lynx fasciatus*. Fur very full and soft; back, chestnut-brown, a little paler on sides and throat; no spots or bands on the back; dusky spots beneath. Ears black inside, with slight grayish patch. Last third of tail black on upper side. Size same as the common wild-cat.

This variety was first described by Lewis and Clark in 1814 as the "Tiger Cat."

III.—GENUS CYNÆLURUS.

This genus, CYNÆLURUS, which is by interpretation "Dog-cat," contains only *one* species. The animals thus described well deserve their name, for they indeed seem half-dog and half-cat. Catlike is the head and long tail; but the rest of the body is doglike, especially the long

limbs, the claws of which are only imperfectly retractile: the muscles for shooting out and drawing back the claws are there, but they are so weak and powerless that the claws always protrude and consequently are worn blunt. The teeth, on the other hand, are unmistakably those of a member of the family of Felidae, but the tail is curled over on itself at the extremity like the tail of a dog. Not only in external appearance are the members of this genus intermediate between the feline and the canine families, but they also display the qualities of both; they have the sharp eye and the cunning of the cat combined with the docility, mildness, and attachment of the dog.

THE CHEETAH.

The CHEETAH, *Cynelurus jubatus* (Plate VIII), is popularly called the "Hunting Leopard," but it can lay no claim to be considered a leopard, and has been so called on account of its spotted hide. Its scientific name *jubatus*, or "maned," has been assigned to it because a quantity of long hair grows on the back of the head and neck. Some writers needlessly distinguish between the African and Asiatic varieties, but the animals are essentially the same.

The Cheetah, with its slender, narrow body, stands higher than the cats proper; the head is small and somewhat rounded like a dog's, the ear is broad and short, the eye has a round pupil, the hide is rough and of a yellowish-gray color, marked with black and brown spots, arranged close together on the back and partly extending along the tail, which is ringed with black toward the end. The body measures about three feet, the tail about two. The African variety, called in Arabic *Fahhad*, has no mane, the predominant color of the fur is orange-yellow, and the tip of the tail is white.

The Cheetah is found in all Southwestern Asia, and is a genuine beast of the plains, depending for its food on its speed and activity. It can creep on the ground, but does so more like a wolf or fox than like a cat: when it quickens its pace it runs with the long leap of the greyhound. It is quite unable to climb. It purrs like a cat, but in a deeper and rougher tone, and at times utters a very peculiar cry, so like the word *Cheetah* that we are justified in supposing that it derives its name from it. Its usual food consists of small ruminants; its speed alone would not enable it to take an antelope, but its catlike cunning comes to its aid. When its prey is visible, it creeps snakelike along the ground till it comes

within twenty or twenty-five paces when a leap of its long legs places it on its victim's back, and it buries its teeth in the throat.

Being docile as a dog, the Cheetah has allowed these natural gifts to be developed and trained by man, and in the East it is as much a part of a hunting establishment as a falcon or a pack of hounds. It is usually the female that is thus used; and when it is taken out to hunt, it is hooded and placed on a light car in company with its keepers.

The places which gazelles frequent are sought out. As soon as one is perceived, the hunters stop, the Cheetah is unfastened and its eyes unbandaged, and the game is pointed out to it. Immediately, under cover of the high vegetation and brushwood, the beast glides off in pursuit, taking advantage with unswerving tact, of the slightest breaks in the ground to conceal its movements. When it considers that it is sufficiently near its victim it suddenly gives itself a series of quick, terrible impulses, springs on the prey after a succession of prodigious bounds, and immediately pulls it to the ground.

Its master, who has followed the events of the chase, then enters upon the scene. To detach it from its victim he throws it a piece of flesh, speaks gently to it, and caresses it; after which he again covers its eyes, and replaces it on the saddle or in its conveyance, while the assistants carry off the quarry.

This amusement is greatly in vogue in Mongolia, and a well-trained hunting-leopard attains an extraordinary price among the inhabitants. In Persia this method of hunting is not conducted in quite the same way. Men and dogs beat the woods and drive the game toward the hunters, who let the Cheetahs loose as the quarry passes them.

The Cheetah can be tamed perfectly, so that it can be allowed to ramble about like a dog; it knows its master's voice and comes when called, nor does it betray any objection to the caresses of strangers. A Cheetah at Paris had a most excellent temper, and after a considerable lapse of time, recognized a negro who had traveled on board the same ship from Senegal.



CHAPTER VII.

THE CIVET CATS.

THE CRYPTOPROCTIDÆ—THE GALET—THE VIVERRIDÆ—THE CIVET—THE ZIBETH—THE GENETS—THE PALE GENET—THE LINSANG—THE HEMIGALE—THE BINTURONG—THE NANDINIA—THE FOUGOUNE—THE MUSANG—THE MASKED PAGUMA—THE MAMPALON—THE ICHNEUMONS—THE MUNGOS OR MANGOUSTE—THE EGYPTIAN ICHNEUMON—THE CRAB-EATING MANGOUSTE—THE ZEBRA MANGOUSTE—THE MEERKAT—THE ZENICK—THE MANGUE—THE BANDED MUNGOS.

THE family CRYPTOPROCTIDÆ forms a link between the Cats or Felidæ and the Civets or Viverridæ, and contains only *one* genus and that genus but *one* species. In figure this animal resembles the Yaguarundi, in color the Cougar; it has the build, the appearance and dentition of the felines, the long body, short legs, short ears, long whiskers and naked soles of the Civets, as well as the remarkable inguinal glands that characterize the latter.

THE GALET.

The GALET, *Cryptoprocta ferox* (Plate XII), attains the length of nearly three feet in the body with a tail about two feet and three quarters. Its fur is short, thick and stiff, and seems shorn on the head and feet; the color is a reddish-yellow, darker on the back; its eyes are like those of the common cat.

The Galet or the Ferret Cat, as the Germans have named it, comes from Madagascar, where it is dreaded to a laughable extent. It attacks the Lemurs, and is a foe to domestic fowl, and occasionally to swine. Its flesh is highly prized as a delicacy by the Malagaseys.

Pollens, the traveler, relates that his native huntsman one day came face to face with a Galet. The creature was surprised and began to spit at him. The huntsman in terror flung away his gun, climbed up a tree and stayed there, trembling in every limb, till the animal had disappeared in the thickets.

Gentle and quiet as the creature appears, it is one of the fiercest known; it is very muscular and active, and is inflamed with an insatiable thirst for blood.

The name of *Cryptoprocta* is given it on account of the manner in which the hind-quarters taper down into the tail. The word is Greek, the first two syllables signifying "hidden," the second two "hind-quarters."

THE CIVET CATS.

The family of the *VIVERRIDÆ* comprises a number of small and moderate-sized carnivorous animals known as Civets, Genets and Ichneumons, which differ from the *Carnivora* hitherto mentioned, by their slender, elongated, round body, their short legs, their long, slender neck and elongated head, as well as by their long, usually pendent tail. The eyes are small, the ears of various sizes; some species have four toes, some five, and many possess retractile claws. But the most remarkable peculiarity about them is the presence near the tail of two or more glands and receptacles, which secrete and store up a fluid of a peculiar, sometimes agreeable odor. While the *Viverridæ* in many respects resemble the *Martens* and *Skunks*, in many others they resemble the *Felidæ* and seem to connect the two groups. They are found in the southern regions of the Old World, chiefly in Africa and Asia; for the so-called American Civet, *Bassaris astuta*, finds its proper place in the family of the *Procyonidæ* or *Racoons*. Throughout the family we find great variety of form, and equally great variety in their haunts; many live in wastes and steppes, or the scanty thickets of the driest portions of Africa and Asia, others prefer fruitful lowlands and the banks of rivers, some approach the settlements of man, others shyly retire into the darkness of the forests, some frequent trees, some never leave the earth.

The *Viverridæ* are mostly nocturnal in their habits, active and lively, but many prowl about during the day. Their movements are characterized by suppleness and grace; and no animals equal these in the serpentine manner in which they glide over the ground, and few in the rapidity with which they spring upon their prey, a rapidity in striking contrast with their usually deliberate gait. Some species have been quite domesticated, the *Ichneumons* and *Mangoustes* being used to keep the houses in Eastern countries free from serpents and other animal pests. Their sense of smell is very acute; their powers of sight vary according

to the habits, nocturnal or diurnal, of the animal; their sense of hearing is less developed.

All species of this family are intelligent and docile, and express by their movements gratitude for kindness; even the wildest varieties soon become tame, and learn to answer to their name.

The great variety of form in the Viverridæ has led to numerous systems of classification; older writers are content with eight genera, but Gray, who has made an exhaustive study of the family, subdivides it into *thirty-three* genera, and *one hundred* species. Of these we shall mention only the most important.

GENUS VIVERRA.

The members of this genus have a long slender body, a long drooping tail, pretty long legs, feet of five toes with half retractile claws, and hairy soles; short broad ears, moderately large eyes with a round pupil and a pointed snout and nose; the soft fur and the highly developed odoriferous glands complete the characteristics of the genus. It is distributed over North and Tropical Africa, and Southern Asia, as far as the Molucca Islands. According to Gray's classification it contains *three* species.

THE CIVET AND THE ZIBETH.

The CIVET, *Viverra civetta*, and the ZIBETH, *Viverra zibetha* (Plate XII), are remarkably alike. The Civet has transverse bands upon a gray ground, narrow and parallel with each other on the shoulders, larger on the body and the thighs, while the Zibeth has the body covered with small round black spots upon a gray ground, sometimes tinted with brown. The tail of the Zibeth has eight or ten rings of a blackish-brown with about two inches of black fur at the tip; that of the Civet has only four or five rings with six inches of black tip. The Zibeth has four black bands on a white ground on the neck, the Civet in the same place, only three; the Zibeth has a white spot under the eye and a gray muzzle, the Civet has no spot under the eye, and the head is entirely black except the upper lip, which is white; in general the Zibeth has more brown than the Civet, whose tints are pure white, while the Civet has a rougher coat than the Zibeth. The words Civet and Zibeth are both European pro-



CRYPTOPROCTA
CIVITT

ICHNEUMON
ZIBETH

PALE GENET
HEMIGALE

ZENICK

PLATE XII. CARNIVORA

nunciations of one and the same Arabic word. The former is a native of Africa, the latter of Asia.

The TANGALUNG, *Viverra tangarunga*, has rather more distinct markings than the preceding species, the three black bands on the throat being very conspicuous. The body has a thick downy covering of soft hair next the skin, which gives the tail a cylindrical aspect. The Tangalung is a native of Sumatra.

The Civets in their natural wild state are rather nocturnal than diurnal creatures, and live on small birds and animals. Numbers are kept in captivity for the sake of obtaining the odoriferous substance they produce. Civet was long a favorite perfume. "He rubbeth himself with civet, a sign that the sweet youth is in love," and "An ounce of civet, good apothecary, to sweeten my imagination," are well known quotations from Shakespeare, who describes it correctly as the "most unclean flux of a cat." This substance is contained in two glands, each of which will hold about the size of an almond; as the civet is formed it is pressed through small orifices into the pouch, which the animal can compress at will. When at liberty it discharges the substance in pieces about the size of a nut every fourteen or twenty days; when captive it is deprived of the secretion by means of a spoon, care being taken to secure the creature so that it cannot bite. Usually the civet is removed twice a week, to the quantity of a drachm each time. When fresh it is white in color, but turns brown. To prepare the civet of commerce, the substance is carefully freed from hairs, washed with water and lemon-juice, and finally dried in the sun. The best kind comes from the Moluccas. When civet was the scent in fashion, large numbers of the animals were kept in Italy and Holland as well as by the traders in Abyssinia.

GENUS VIVERRICULA.

The RASSE, *Viverricula malaccensis*, the *only* species of the genus, is the Javanese Civet. Its head is wedge-shaped and the ears close together, the fur is rigid, coarse and scanty, and is marked along the back with eight parallel lines. It is found usually in forests slightly elevated above the sea-level; it preys on small birds and animals, and has the sanguinary appetite of the family in a high degree. It preserves, unlike the Zibeth, the natural ferocity of its disposition in captivity. Its perfume is highly valued by the Javanese.

GENUS GENETTA.

This genus differs from the preceding by the fact that the pouch is reduced to a slight hollow formed by the projection of the glands, and that there is no sensible secretion although there is a most manifest odor. It embraces *five* species.

The body is slender and elongated, the muzzle pointed, the limbs short, the whole appearance, indeed, that of the marten. The Genets live in low grounds and are easily tamed. The eye resembles that of the common cat, and the claws are retractile; like the Civets they live on a mixture of animal and vegetable food.

THE GENETS.

The COMMON GENET, *Genetta vulgaris*, is found in Africa, and even in the South of France. It is a very beautiful and graceful animal, of a gray color mixed with yellow, on which dark patches are lavishly scattered, and the full bushy tail is covered with alternate bands of black and white. The muzzle is black except a white patch on the upper lip.

The PALE GENET, *Genetta Senegalensis* (Plate XII), has a whiter fur and different markings; the spots having a tendency to form stripes, and the hinder legs are quite black at the ankle-joint.

GENUS LINSANG.

This genus contains *two* species found in Malacca and Java, and differs very little from the general characteristics of the Genet group. The head is pointed, the body uncommonly elongated, the legs short, the tail as long as the body, the fur smooth and close.

The LINSANG, *Linsang gracilis* (or *Prionodon gracilis*), is of a gray or yellowish-white color with black-brown spots and bands; the tail exhibits seven broad dark rings and has a white tip.

GENUS HEMIGALE.

This genus from Malacca and Borneo is represented by only *one* species, the *Hemigale Hardwickii* (Plate XII). The color of its fur is

grayish brown, with six or seven bold stripes across the back; these bands are broad on the back but narrow to a point on the flank, and are unconnected with each other. The latter half of the tail is black.

GENUS ARCTITIS.

The BINTURONG, *Arctitis binturong*, is of a dead black color, with long coarse dull hair; the head is gray and each ear is furnished with a long tuft of black hair, the tail is longer than the body and covered with exceedingly bushy hair. The muzzle is short and sharp, rather turned up at the extremity and covered with long brown hairs which radiate round the face.

The Binturong is a good climber of trees, being assisted by its thick and powerful tail, which is prehensile at the end.

The *only* species known extends from Nepaul to Java and Sumatra.

GENUS NANDINIA.

This is another genus that contains only *one* species, the *Nandinia binotata*, which some writers have classed with the Civets, some with the Ichneumons. It derives its epithet *binotata* from the double row of spots on the body. The general color of the fur is a rich dark brown, and the tail is marked with obscurely defined blackish rings.

GENUS PARADOXURUS.

This genus has the dentition and general characteristics of the Genets, but the walk is almost plantigrade, and its tail coils spirally although it is not prehensile. It contains *nine* species.

The POUGOENE, *Paradoxurus typus*, comes from the East Indies, and is of a brownish-yellow color with some browner markings; the feet, muzzle and part of the tail are black; on each side of the spine there are three rows of elongated spots, which, when viewed in certain lights, are merged into lines.

The MUSANG, *Paradoxurus fasciatus*, is a native of Java, Borneo and Siam, and is commonly called the "Java Cat." It is smaller than the

Pougouné, and has a coarser and shorter fur, which presents great varieties of color in different specimens.

The MUSANG is, although a destroyer of rats and mice, a great pest to the coffee-plantations, which it ravages in such a manner as to have earned the additional title of the "Coffee Rat." It feeds largely upon the berries of the coffee-shrub, and it is a remarkable fact that the berries thus eaten appear to undergo no change by the process of digestion, so that the natives, who are free from over-scrupulous prejudices, collect the rejected berries, and are thus saved the trouble of picking and clearing them from the husk. However, the injury which this creature does to the coffee-berries is more than compensated by its very great usefulness as a coffee-planter. For, as these berries are uninjured in their passage through the body of the animal, and are in their ripest state, they take root where they lie, and in due course of time spring up and form new coffee-plantations, sometimes in localities where they are not expected. The Musang is not content with coffee-berries and other vegetable food, although it seems to prefer a vegetable to an animal diet. When pressed by hunger, it seeks eagerly after various small quadrupeds and birds, and is often a pertinacious robber of the hen-roosts.

GENUS PAGUMA.

This genus containing *three* species is found in Nepaul, China and Borneo, and Singapore.

The MASKED PAGUMA, *Paguma larvata*, used to be placed among the weasels, and called the Masked Glutton. The name *Larvata* or Masked, is given to it on account of the white streak down the forehead and nose, and the white circle round the eyes, which gives the creature an aspect as if it was endued with an artificial mask. There is a pale olive-gray band extending from the back of each ear and meeting under the throat, and the general color of the fur is an olive-brown, sprinkled with gray. In China it bears the name of Yu-min-mao. It is a good climber of trees and is nocturnal in its habits. The other species are the WHITE WHISKERED PAGUMA and the WOOLLY PAGUMA.

The genera we have hitherto described have been formed by Gray into the sub-family of the VIVERRINÆ; we now proceed to his second sub-family, that of the HERPESTINÆ.

GENUS CYNOGALE.

Another genus of only *one* species.

The MAMPALON, *Cynogale Bennettii*, has a thick compact body, a long head, pointed muzzle, very short tail and legs, and is remarkable for a strong beard of long yellowish-white bristles, behind and above which there are brown bristles, while the cheeks are adorned with two bundles of long, strong, whitish hairs. The animal is plantigrade, but can climb trees. It is a native of Borneo and Sumatra, and lives on fish, birds and fruits.

GENUS GALIDICTIS.

Madagascar furnishes the *two* species which constitute this genus. Little is known of either, except the account furnished by Dr. Gray in the Zoological Transactions of London.

The *Galidictis Vittata* is gray, with eight black-brown streaks on the back and sides, and attains the length of fourteen inches, with a tail of twelve inches. This animal is remarkably agile, keeping its long bushy tail erect as it runs about, and uttering a chirp like a rat. One that was kept on board ship for six months soon became tame, and preferred raw eggs for food. Its method of breaking them was amusing: it would roll one toward a projecting timber, then lying down on its side, it grasped the egg with all its feet and threw it with a sudden jerk, repeating the process till the contents were obtained.

THE ICHNEUMONS.

Under the popular name of Ichneumon, numerous genera are embraced. The word Ichneumon is Greek, and signifies the "tracker," from the fact that the best representatives of the group display remarkable patience and skill in tracking their prey to its hiding-place.

GENUS HERPESTES.

This is a well-defined genus containing *twenty-two* species, of which we need mention only two or three. In this genus the pouch is voluminous, and single instead of double.

The GARANGANG, *Herpestes Javanicus*, abounds in the teak forests of Java; it attacks and kills serpents with great boldness; and it is said by the natives that, when the snake has coiled itself round the Garangang, the latter inflates its body to a considerable extent, and when the reptile is about to bite contracts again, slips from between the folds and seizes the snake by the neck. It burrows in the ground, and is expert in pursuing rats. It is easily tamed and becomes very docile, following its master like a dog.

THE MUNGUS.

The MUNGUS or MANGOUSTE, *Herpestes griseus*, is a native of the East Indies; it measures about a foot, and its tail is about the same length; but it is difficult to ascertain its exact size, as it can contract or elongate its body several inches.

Its color is a dirty-gray; the circumference of the eye, the ear, and the muzzle are naked and violaceous; the tail is the same color as the body, very thick at the root, and terminating in a yellowish point, and the hairs bristle up like the cat's when the animal is irritated.

The NYULA, *Herpestes Nyula*, has its fur marked in a singularly beautiful manner, the pattern resembling fine basket-work; on the back the pattern is tolerably large, but it becomes smaller on the head, and on the nose is microscopically fine, although as perfect and uniform as on the body. The paws are dark.

The MELONCILLO, *Herpestes Widdringtonii*, deserves notice as the only European Ichneumon. It was long known to Spanish sportsmen, who hunted it for the hairs of its tail, which were used to form paint-brushes. It is probable that it occurs also in Africa.

It lives in river bottoms, chiefly in the provinces of Estremadura and Andalusia, where the Esparto grass abounds. It measures, including a tail of twenty inches, about three feet and a half. The fur is short on the body, the lower surface being almost bare, but becomes longer on the spine and tail; a dark-gray is the prevailing color, but the tip of the tail is black.

The Mungus proper is a cleanly, lively, good-tempered creature, and keeps the house of its owner free from rats and mice, and such creatures, as well as from those horrible nuisances in all tropical countries—snakes and scorpions. It is from its combats with the latter that it obtains its fame. The name it bears has been given it because, according to native

reports, when it is bitten by a poisonous serpent, it digs up a very bitter root named the Mungo-root, which it eats, and then with renewed vigor resumes its combat with its foe. European observers who have watched the animal when it leaves the field of battle, say it eats either grass or any other herb in the neighborhood. An eye-witness writes: "The snake—a Spectacled Snake—was a yard and a half long; the Mungus attacked it immediately, and a terrible struggle ensued. At the end of five minutes the snake struck the Mungus with its poison-fang. The animal fell, lay for some time like a dead thing, and foamed at the mouth; then suddenly rose and rushed into the jungle. In twenty minutes it returned and renewed the attack with greater spirit than ever, and killed the snake within six minutes."

In 1871 the governor of one of the West India Islands consulted the Zoological Society of London how to get rid of the terrible Lance-snakes. Mr. Sciater recommended the Mungus, and sent two living ones to Santa Lucia. On their arrival Governor Des Vœux resolved to try their powers. A snake was brought in in a glass bottle; the Mungus at once displayed great animation, and tried to open the glass bottle by pulling out the rags which served as a stopper. He succeeded; the snake came out, the Mungus sprang at it, the snake drew back quickly, then struck like lightning, and the Mungus leaped into the air screaming. But it at once rushed afresh to the attack, and after a few minutes dragged the serpent to its cage, where it devoured its captive at leisure. After the lapse of an hour nothing but the tip of the reptile's tail was left, and the Mungus was as well as ever. He suffered no inconvenience from the poison.

The ICHNEUMON, *Herpestes Ichneumon* (Plate XII), has been famous for ages. Herodotus relates that the Ichneumons were embalmed and entombed in the shrines of every city of old Egypt. Strabo affirms that it never attacks its foes—the serpents—without calling its companions to its aid. Elhan maintains that, before going into the battle, it rolls itself in the mud, and then dries this coating in the sun till it can resist the serpent's fangs. Pliny asserts that the crocodile sleeps with its ponderous jaws wide open, and that the Ichneumon seizes this opportunity to jump into its mouth, eat its way to the heart, and then out of the monster's belly. The Roman writer adds that the Ichneumon creeps about till it finds the hidden eggs of the crocodile and eats them all, thus deserving the gratitude of mankind. All these pretty stories unfortunately are devoid all foundation in fact.

The Ichneumon, when fully grown, is as large or larger than our domestic cat, but seems smaller owing to its short legs. The body is slender, but by no means so graceful as that of the Genet; the feet have naked soles, and are partially webbed. The long tail appears, in consequence of its long hair, to be very thick at the root. The eyes are prominent, the ears short, broad and rounded. The fur consists of a thick, woolly, russet-colored felt, covered with long hair marked with black and yellowish rings, and having a dull yellow tip.

The Ichneumon, or Pharaoh's Rat, extends over all North Africa and Northwestern Asia, and is always found near the habitations of man, frequenting the reedy banks of rivers or the hedges which surround the fields; through these reed-beds it forms narrow roads which lead to its nest, where the female brings forth her young. Brehm describes the Ichneumon as strictly diurnal in its habits, and as timid and suspicious, possessing the evil odor and bloodthirstiness of the marten. It eats everything—snakes, worms, lizards, mice, reed-birds; its plunder of the nests of hens and pigeons renders it hateful to the fellaheen. At present it does not come into contact with crocodiles, the latter being nearly exterminated in Lower Egypt. Its mode of progression is very serpent-like; it seems to glide over the ground without using its legs. In the summer, when the young ones have been born, the whole family may be seen together, following each other in Indian file so closely that they seem to be one snake-like creature. The sense of smell is highly developed, and is the means by which the Ichneumon tracks his prey.

The Ichneumon was, in the land of the Pharaohs, an emblem of the Deity as the destroyer of evil; in the Egypt of Turkish Pachas and Greek traders it is considered a charitable action to kill it. When a report spreads that some traveler is going to kill a Nims, as the Arabs call the beast, young and old rejoice; the peasant drops his hoe, the weaver quits his loom, the waterwheels stop, and all the population flock to witness the destruction of the murderous little thief.

The sportsman must use a strong charge of powder and fire at a short range if he wishes to kill, for the Ichneumon possesses incredible tenacity of life, and will certainly escape if only wounded. The Ichneumon is easily tamed and is as playful as a cat, but it is not of much use to its master.

Like other illusions of our youth, belief in the virtues of the Ichneumon is torn from us by modern philosophers.

GENUS URVA.

The only species of this Eastern genus is the CRAB-EATING MANGOUSTE, *Urva cancrivora*. It seems to occupy a position between the Mangoustes proper and the Gluttons. It is easily distinguished by the narrow stripe of long white hairs that runs from the mouth to the shoulders, and the bushy base of the tail. It was discovered in the swampy jungles of Nepaul, but beyond its passion for crustaceous food nothing is known respecting its habits.

GENUS ARIELA.

The ZEBRA MANGOUSTE, *Ariela taniata*, is again the only species of the genus. It is one of the smaller members of the family, and does not much exceed a foot and a quarter in length. The fur is rich, of a fawn-gray color; on the head and neck the hairs end in black or brown and white; on the back, in dark and fawn-colored tips; thus producing nine to ten pairs of regular dark and light transverse bands.

The Zebra Mangouste is found in all Eastern Africa, from the Cape of Good Hope to Abyssinia. It can be easily tamed, and soon becomes attached to its masters. It is said to attract some small birds within its reach by imitating their cries.

Brehm describes two Mangoustes which he had in his possession: "As soon as I let them out of the cage they rambled through the whole house, and in a few minutes had explored it all. They first visited the milk-bowl, lifting the lid up with their snout: they then collected all the bones they could find, preferring marrow-bones; they extracted the marrow as far as possible with their claws, but when they could reach no further they took the bone in their fore-paws, stood up on their hind-legs, and threw it between their hind-legs against the wall with violence sufficient to dislodge the marrow."

GENUS CYNICTIS.

This genus, comprising *three* species, is closely allied to the Ichneumon, but differs in the formation of the feet—the animals comprehended

in it possessing five toes on the front and four on the hinder legs, and the soles of the feet are partly covered with hair. The body is slender, the ear short and round, the hair long on the sides of the tail.

The MEERKAT, *Cynictis Levallantii*, attains a length of two feet and a half; its fur is smooth, its tail bushy; its color is reddish, whence it is called sometimes the Ruddy Ichneumon: the tail is sprinkled with silver-gray and has a white tip: long black hairs project over the eyes and on the lips.

It is found from the Cape of Good Hope northward in the lowlands and plains of South Africa, living on mice, birds, and insects: it is savage, cunning, and agile.

Its specific title has been given it in compliment to the well-known African traveler Le Vaillant.

The following genera belong to Gray's third sub-family, the Rhinogalidæ:

GENUS SURICATA.

This remarkable genus resembles the *Herpestes* in the color and markings of its fur, but it is distinguished from them and all the *Carnivora* hitherto mentioned by possessing only four toes on each foot, and these are covered with a fine skin like the human hand. The odoriferous glands are not developed into a pouch with separate external apertures. Only *one* species is known.

The ZENICK, *Suricata zenick* (Plate XII), is of a dull-brown color, crossed transversely by slight bands; the tail is brown, and the length of the body from the tail to the muzzle is about a foot. It moves quickly with the body arched, not low like the *Mangoustes*; it is plantigrade, and can stand up on its hind-legs and carry food to its mouth with its fore-paws. The Zenick is easily tamed, and acquires a cat-like affection for the house it inhabits. It is a native of Africa.

The Zenicks are less carnivorous than the rest of the *Viverridæ*, and seem to form an intervening link between the *Mangoustes* and the family of the *Mustelidæ* or *Martens*.

A specimen lived for some time in the Jardin des Plantes at Paris, but nothing is known of the animal's habits in its wild state.

GENUS CROSSARCHUS.

The animals of this genus have the teeth, the muzzle, the pouch, the gait of the Zenicks, but the toes and other organs of the Mangouste. Only *one* species is known.

The MANGUE, *Crossarchus obscurus*, is a native of Sierra Leone. The body is compact, the head round with a pointed muzzle, the tail of medium length, the legs moderately long, all the feet have five toes, the ears are small, the eye has a round pupil with a third undeveloped lid, the tongue is long. The color of the animal is a ruddy-brown, which in certain lights presents a yellowish tinge, owing to the alternate rings of white and brown with which each hair is marked.

GENUS MUNGOS.

This African Genus contains three species, of which we need mention only the most typical.

The BANDED MUNGOS, *Mungos fasciatus*, is a small animal not much larger than a water-rat. The color is a blackish-grizzled with a chestnut tinge on the hind-quarters and a row of darker lines across the back. It is very lively in its movements, and utters continuously a curious sound like a frog's croak; when excited it spits like a cat and bites furiously at its companions. The fore-paws are armed with long claws, and it is an admirable climber.



CHAPTER VIII.

THE AARD-WOLF AND THE HYÆNAS.

THE FAMILY PROTELIDÆ—THE AARD-WOLF—THE FAMILY HYÆNIDÆ—FABLES AND SUPERSTITIONS
ABOUT THE HYÆNA—THE STRIPED HYÆNA—TWO TAME ONES—THE BROWN HYÆNA—THE
SPOTTED HYÆNA OR TIGER-WOLF—RAPACITY OF THIS SPECIES—ITS HORRID LAUGHTER.

THE family PROTELIDÆ is limited to *one* genus and *one* species, which is found only in South Africa.

The AARD-WOLF, *Proteles cristatus* (Plate XIII), is a highly modified form of the hyæna, and seems to form a link between that family and the civet-cats. Some naturalists, indeed, have called it the Civet-hyæna, but it is usually known by the appellation bestowed upon it by the Dutch colonists of the Cape of Good Hope. It is much smaller than the hyænas, and larger than the civets; in appearance it bears a striking resemblance to the striped-hyæna, possessing the same powerful and well developed fore-quarters with the low sloping hind-quarters, and coarse rough fur; the tail is very large in proportion to the animal's body, and covered with thick bushy hair which is black at the tip of the tail; like the hyæna it has a thick bristling mane on the back of the neck and shoulders, and it can erect this hirsute appendage when excited. Its ears, however, are larger than those of the hyæna, and its fore-feet are armed with powerful claws, the thumb being, as in dogs, very slightly developed. The Aard-wolf attains the length of about three feet and a half, including the tail, which measures about one foot. The fur consists of a soft woolly coating, through which the stiff rough hairs grow, and it is marked with black vertical stripes on a dull yellow ground; the head is chiefly black, the mane is black and yellow mixed.

The Aard-wolf is nocturnal in its habits, and passes the day in a burrow which it digs skillfully with its powerful claws. From this practice of burrowing it derives its Dutch name, which means Earth-wolf.

These burrows differ from those of the fox and other animals, in being the habitations of several individuals. Several deep tunnels are dug which converge to one small chamber where three or four Aard-wolves take up their residence. Verreaux, the companion of Lalande, who first described the animal, drove some from their abode; he remarked that one in place of running away began to burrow in a new spot with remarkable dexterity. The same observer states that the favorite food of the Aard-wolf consists of lambs, but that at times it kills a sheep, of which, however, it devours only the tail; carrion seems to form its staple article of diet; it sometimes makes a meal of the white ants.

It is probable that the Aard-wolf is more widely distributed than is commonly assumed. A traveler in Nubia reports that he found there a civet-hyæna, which had been killed by some natives, and which seemed to resemble perfectly the Aard-wolf of the Cape.

THE HYÆNAS.

The HYÆNIDÆ constitute another small family of *one* genus and *three* species, of which one only is found out of Africa.

The Hyæna is one of the animals which the showmen of menageries love to dilate upon; blood-thirstiness, rapacity and cunning are the least crimes laid to its charge; it is accused of beguiling travelers by imitating the laughter of human revellers, and then falling upon them and devouring them; and represented as digging human corpses out of their graves to gratify its loathsome hunger. Some ancient authors give the hyæna three rows of teeth like the shark (*des Merveilles Hyane*), and prickly darts at the end of its tail; some affirm that its eyes become stone after death. The Arabs regard the animal as a disguised magician who, by day, assumes a human form, but, by night, appears as the hyæna, and they warn travelers from shooting them. "These bewitched men," said an Arab, "who are cursed by God, the most High, can, by the mere glance of their evil eye, stop the blood in the veins of the righteous and make his heart cease to beat. Our Lord, Kurshid Pacha—may God be gracious to him!—burned several villages in which these magicians dwelt, but he died suddenly—the glance of the evil eye slew him. Listen to their cries! are those the cries of a beast? Assuredly not; they are the lamentations of a human being, or rather this voice is the laughter of the devil. I knew a young

man who killed a hyæna—next morning he had become a girl; I knew another whose leg withered after he had slain one of these magicians. Refrain, O my brother," he continued, addressing the traveler; "point not thy musket at what thou deemest a beast; for it is a son of the accursed one."

The appearance of the hyænas justifies the dislike of mankind; they resemble dogs, and yet are repulsively dissimilar. The fore-legs which are used for digging are powerful, the hind-legs short; the disproportion between the limbs gives them a shambling, slouching gait, and the sloping line of the back has a sneaking, cowardly look. The teeth and jaws are remarkably strong, and crash through the thigh bones of an ox with savage force; the muzzle is short, the tongue rough like a tiger's; the feet have four claws.

The hyæna is nocturnal, and usually avoids populous neighborhoods. It is in darkness and solitude that the traveler hears the peculiar cry of the prowling troop that makes night hideous till the dawn is breaking. A piece of stinking carrion attracts them in numbers, but they seldom attack powerful animals; and never unless the latter take to flight. Thus they often destroy healthy cattle that can run away, but are afraid to touch the sickly or maimed ones which are forced to stand at bay. Schweinfurth the African traveler, however, says that in the country of the Njam-njams they pursue and run down the antelope as wolves run down their prey. But this must be quite an exception. The voracity of the hyæna is frightful to witness, and the noise made by a pack over their favorite carrion, scarcely to be described. The screams, the growls, the piercing shrieks of laughter easily suggest to the natives that hell has broken loose. They are useful as scavengers by removing decaying animal matter, especially in the interior of Africa where the corpses are simply flung outside the villages. Further to the South in the Hottentot country, they dig up the remains of the dead which are interred in shallow graves. They everywhere follow the caravans that cross the deserts, as they know some victim will fall into their clutches.

THE STRIPED HYÆNA.

The STRIPED HYÆNA, *Hyæna striata* (Plate XIII), is distinguished by its peculiar stripes. The general color is grayish-brown with blackish stripes running along the ribs; a large black patch covers the front of



AARD WOLF

BROWN HYENA

SPOTTED HYENA

STRIPED HYENA

PLATE XIII. CARNIVORA.

the throat, and black hairs are sprinkled abundantly over the whole fur; the mane on the crest and shoulders has hairs with black tips. The length of this species is about three feet and a quarter, in the body.

The Striped Hyæna extends from Sierra Leone in Africa as far east as the Altai Mountains in Asia. It is the least injurious of its kind, and the abundance of carrion and bones it finds everywhere, saves it from being driven to attack living things. Its cowardice is incredible, although they will prowl close to a village or camp. It can be easily tamed. Brehm had a pair which behaved just like dogs—leaping up and gamboling around him. During the sail down the Nile they were fed every third day, but on one occasion had to fast eight days. Some of the wild Eastern dogs were shot for them. When the carcasses were brought, the hyænas laughed aloud and rushed like mad creatures on the food. A few bites tore away the covering on the breast, and then they plunged their black muzzles into the entrails till their heads were all besmeared and clotted with gore.

The hyæna always eats rapidly and in large mouthfuls, and has been seen to swallow a bone nine inches long; a wise instinct; food thus swallowed takes a longer time to digest, and hence hunger recurs less soon. It lives in holes or in clefts of the rock; its smell is so offensive that no other animal will come near its carcass, and dogs, when they come across the trail of a living one, exhibit every mark of fear and keep as close as they conveniently can to their master's heels.

THE BROWN HYÆNA.

The BROWN HYÆNA, *Hyæna brunnea* (Plate XIII), is distinguished from the other species by a long, rough mane hanging down on both sides. The color is uniformly dark-brown, with a few white lights on the legs; the hair of the mane has a whitish-gray ground, the rest being blackish-brown. It is about the size of the Striped Hyæna.

The Brown Hyæna inhabits the South of Africa, usually in the vicinity of the sea. It is less common than the striped species, but resembles the latter in its habits; it feeds chiefly on carrion cast up by the waves, and hence is sometimes called the Strand Wolf. It does not possess the horrible laughter-like cry of its congeners.

Some specimens have been seen in which the brown fur has a warm chestnut tinge.

THE SPOTTED HYÆNA.

The SPOTTED HYÆNA, *Hyæna crocuta* (Plate XIII), is the largest of the tribe, and is distinguished by its powerful frame and spotted fur. The latter consists of a whitish-gray ground, inclining more or less to fawn-color, with brown spots on the sides and limbs. The head is brown, the cheeks reddish, the tail ringed with brown, and tipped with black. Some trifling varieties of these colors are found, some specimens being lighter, some darker. The animal attains a length of over four feet, and stands nearly three feet high.

The Spotted Hyæna inhabits Southern and Eastern Africa, from the Cape of Good Hope to the 17th degree North Latitude. It is common in the Soudan and Abyssinia, and when it is found in large numbers it drives away the Striped Hyæna. Its size and strength render it much more an object of dread than the latter, and many observers agree in stating that it will attack men, especially if they are asleep or weary, and that, when hunger conquers its native cowardice, it will enter villages even in the daytime, and carry off children or the sheep returning from the pasture to the folds or enclosures.

The title Tiger Wolf was given it by the farmers of the Cape of Good Hope, where it is very common, and where every farm-house has a trap set for this prowling marauder. One method of killing it is to fix a loaded musket on a couple of posts about thirty inches from the ground. A string is then carried from the trigger through a ring at the butt, and then forward to the muzzle, where it is attached to a piece of meat. The hyæna scents the meat, seizes it between his teeth, and thus draws the trigger and lodges the bullet in his brain. The natives regard it with dread, and justly. Strodtmann relates that in a few months he heard of forty deaths of children caused by the Tiger Wolf; these hungry hyænas enter the kraals of the Kaffirs, venture even near the blazing fire where the family is sleeping, and carry off a child from under its mother's cloak before they can be intercepted.

It is this species which is the subject of the fables we have already mentioned, and which deserves to be called "The Laughing Hyæna." Of all the Carnivora it is the most repulsive and voracious: it is stupid, malicious, and only capable of being tamed to a certain degree by the whip. In captivity it lies for hours like a log, then leaps up, rubs itself

against the bars, and utters its horrid peals of laughter, which seem to be an expression of a pleasurable sensation. It accompanies this maniacal, mirthless, hysterical laugh with most absurd gestures—dancing about in a state of frantic excitement, running backward and forward, spinning round on its hind-legs, and nodding its head to the ground.

This Hyæna usually lives in holes, or amongst rocks in retired localities, and when the sun has set he comes forth and searches for food. He then utters a long melancholy howl, which finishes with a sort of bark, and occasionally that fiend-like laugh which, when heard in the desert, amid scenes of the wildest description, calls up in the imagination of the solitary traveler the forms of some spectral ghouls searching for their unnatural feast.

One of these animals was discovered in a state of sad laceration. The two fore-paws were gone, and the legs themselves had been frightfully torn, evidently by some powerful beast of prey. The natives said that it had been thus punished by the lion for interfering with his arrangements, and stated, moreover, that the lion frequently corrected the forward conduct of the Hyæna by biting off every one of its paws. This statement, curious as it may seem, was corroborated by several experienced hunters.

It has already been mentioned that the Hyæna is in no wise fastidious in its diet, and that it will habitually consume the most indigestible of substances. Yet there seems to be something capricious about the function of assimilating food, which is subject to remarkable fluctuations. To one of these animals, after a fast of thirty-six hours, a dead rat was given, which, as might be expected, it immediately swallowed. In fifteen minutes the creature rejected the skin and bones of the rat, though the same animal would have eaten with impunity the heavy bones or tough hide of a veteran ox, or even would have made a satisfactory meal on a few yards of leathern strap.

But enough respecting these repulsive creatures—these hideous caricatures of the nobler Canidæ.



CHAPTER IX

THE WOLVES.

GENERAL DESCRIPTION OF THE GENUS CANIS—THE COMMON EUROPEAN WOLF—THE JACKAL WOLF—THE KAFFEROO—THE STRIPED WOLF—THE AMERICAN WOLVES—THE GRAY WOLF—THE COYOTE—THE RED WOLF—THE SOUTH AMERICAN WOLVES—THE CRAB-EATING WOLF—THE AGUARACHAY.

THE family of the CANIDÆ, comprising the animals commonly known as dogs, wolves, and foxes, has an almost universal range over the earth, being only absent from the island sub-regions of Madagascar, the Antilles, Austro-Malaya, New Zealand, and the islands of the Pacific. With the exception of the HYÆNA DOG and the GREAT-EARED FOX, all the species are usually placed in the genus CANIS. The family is pretty clearly defined, but in its structure does not differ from the Felidæ so widely as is commonly supposed. As a whole, the animals embraced in it do not attain the size of the large species of the cat family, and are far inferior to the latter in cruelty and love of slaughter. They are nearly equal to them in agility; their blunt claws, indeed, do not permit them to climb, nor can they perform the enormous leaps which the cats execute; but they are excellent runners, and their wonderful perseverance far exceeds anything of the kind displayed by the Felidæ. They are all swimmers, and some of them are masters in the art, and love to be in water. Their senses are all highly developed, that of smell in particular attaining a wonderful degree of acuteness.

All the species of the CANIDÆ exhibit great intelligence; the lower ones betray remarkable cunning and slyness, sometimes at the sacrifice of courage; but the higher varieties, especially those which have been long associated with mankind, prove that their faculties have been cultivated to an extent which no other animal has reached. The tame dog and the untamed fox act with reason and deliberation, and execute carefully-prepared plans, the result of which they have foreseen. The

very wildest species exhibit this quality of foresight, and act with circumspection—only the most violent pangs of hunger ever changes this characteristic.

Their food usually consists of mammals and birds, but all the species have a preference for carrion; nor do any member of the family refuse to make a meal of reptile, fish, or mollusc. In addition they will eat honey, fruit, roots, buds, grass, and more. The females usually bring forth four to nine at a birth, and are always most devoted mothers.

The family is divided into *three* genera and *fifty-four* species.

I.—GENUS CANIS.

This genus contains *fifty-two* species; and the one with which we shall begin our account is that which plays so important a part in our nursery tales and in the mythology of many nations, the Wolf.

THE WOLF.

The Greek and Roman writers speak of the wolf with a kind of superstition awe, on account of the supernatural qualities they attributed to it. In Greece the wolf was especially connected with the worship of Apollo, and near the great altar at Delphi, the chief seat of the worship of that divinity, there stood an iron wolf. In Rome the wolf was regarded as the nurse of the founders of the city; and the brazen she-wolf, with Romulus and Remus sucking her, is still one of the ornaments of Rome. In the mythology of our ancestors the wolf occupies a distinguished place as the favorite animal of Woden. Two wolves sit before his feet, and when the end of all things is at hand, one of them shall devour the sun, the other the moon. Then comes the "Twilight of the Gods." The wolf Fenris breaks loose; his lower jaw reaches to the earth, the upper one to heaven; he swallows up Woden himself, and fire and flame spread over the earth and the whole universe is consumed. Christianity modified these stories. Woden and his wolves became the Wild Hunt man and his dogs; and the wolf became, in popular superstition, one of the forms assumed by magicians and witches, or imposed by them on their victims. Gervase of Tilbury writes: "We have often seen in England men changed at the full moon into wolves, which kind of men

the English call werewolves." In the great beast-epic of the Middle Ages, "Reynard the Fox," the wolf appears as Isengrim; and the wolf in "Little Red Riding Hood" is still a terror to countless children.

The WOLF, *Canis lupus*, as it is found in Europe, may be taken as a type of the group. It possesses the form of a large, long-legged, thin dog, and carries its tail drooping; the head is thick, the muzzle pointed, the eyes oblique, the ears always erect. The fur varies according to climate, both in thickness and color: in northern countries it is long, rough, and dense, bushy on the tail, erect on the neck; in southern regions it becomes shorter and rougher. The color is usually gray, with a tinge of fawn color, but mixed with a great deal of black. This color becomes somewhat reddish in summer; in winter more yellowish. In the north, the lighter tints are predominant; in the south, the darker. Wolves that live in mountainous districts are generally large and strong; those that live in plains are smaller and weaker, but equally rapacious and audacious.

The wolf is still widely diffused in Europe, with the exception of the British Isles and Northern Germany. In England it was extirpated, according to some accounts, by the Saxon king Edgar, and in Scotland during the seventeenth century, while in the Prussian provinces it is now rare. In Russia, Southern Austria, Hungary, and the Slavonic principalities, as well as in the three Scandinavian kingdoms, it still ravages to a terrible extent. In France, regular wolf-hunts are legally ordered to take place every three months. The prefect of the department issues directions to the mayors of each commune, who name the inhabitants who are to take part in them; a fine of sixteen to one hundred francs is imposed on all who shirk this duty, and a bounty is paid of six francs for a whelp, twelve for a male wolf, fifteen for a female wolf not in young, and fifty for a female if pregnant. M. d'Houdetot gives the number of wolves annually destroyed in France as twelve hundred. Under the old regime an office of *Grand Louveter* or Grand Wolf-hunter existed, while each province had a subordinate *louveter*, who levied a tax on each inhabitant residing within a radius of two miles of the place in which a wolf was killed.

In spring and summer the wolf is found alone or in pairs; in autumn he appears with his young family; in winter he unites with his neighbors into packs. The members of these packs work in company, range the country in every direction, and become a terrible scourge.

In those plains of Siberia that are infested by wolves a sledge journey is far from agreeable, for frequently a band of these ferocious brutes persistently follows travelers. If the sledge stops for only a second, the men and horses are lost; safety exists only in flight. The struggle on such occasions is fearful. The horses, mad with terror, seem to have wings. The wolves follow on their track, their eyes flashing with fire. It is a terrible situation to be placed in, to behold these black spectres tearing across the surface of the white shroud of snow, thirsting for your blood. From time to time a report is heard; a wolf falls. More audacious than the others, the victim had tried to climb the sledge, and one of the travelers has shot it. This incident gives some advantage to the fugitives; for the carnivorous troop halt for a few seconds to devour the body of their companion. But the end is nigh: the village or castle appears against the gray sky, and the wolves are deprived of their anticipated prey. At other times the adventure terminates in a tragical manner: after a pursuit of some hours, the team, exhausted and incapable of progressing farther, is overtaken; the sledge is surrounded and carried by assault; the rest may be imagined!

Certain wolves—fortunately they are rare—show a marked preference for human flesh. Such was the notorious animal which desolated Gévaudan, in the second half of the eighteenth century, and whose evil reputation yet survives. This animal was of enormous size (measuring about six feet from the point of the nose to the tip of the tail), and for several years defied all efforts made for its destruction. In India, where wolves are classed among sacred animals, they levy tribute on mankind, carrying off every year numbers of children.

Bold as the wolf usually is, it is exceedingly suspicious; a stick and a piece of rag will keep it at a distance from the carcass of a deer, and a piece of rope trailed from a carriage is always an object of much fear.

All methods are justifiable for the destruction of the wolf: snares, traps, even poison. It is said that a trapped wolf will permit itself to be handled without attempting to resist, and will even lie passively by the hunter's side till he resets his trap. The bite of the wolf is peculiar; it is a short, fierce snap delivered with such energy that when it misses its mark the jaws clash like a closing steel trap.

The wolf can be tamed; Cuvier relates the history of a wolf that lived in the menagerie of the Jardin des Plantes, Paris, which, after being reared by a person who had to leave to proceed abroad, displayed more pas-

sionate affection for its master than the most devoted dog could have shown. And this is not a single isolated example, for they have been trained to hunt like dogs.

THE STRIPED WOLF.

The STRIPED WOLF, *Canis adustus*, is a link between the wolf and the jackal; the body is long, the head is fox-like, the eyes are placed obliquely and have rather elongated pupils; the ears are wide apart; the legs remarkably long and slender; the tail touches the ground. The color is a brownish-gray; a dark stripe runs from the mouth to the ear, a black band crosses the breast, a fawn-colored stripe with a black border traverses the sides longitudinally, the tail is fawn-colored at the root, black in the centre, but pure white at the tip.

The Striped Wolf extends from the Cape of Good Hope to Zanzibar on the East, and the Gaboons on the West Coast of Africa. It is probably the Mboyo of Du Chaillu.

THE KABEROO.

The KABEROO, *Canis simensis*, is a native of Abyssinia, very slender and very like a greyhound. But it is neither a domestic dog gone wild, nor a variety of jackal, but a real species of wolf. The Kaberoo is widely dispersed in the interior of Africa, where it does enormous damage to the shepherds. The natives of Cordofan call it the dog of the wilderness, and regard it as more destructive than the hyæna dog itself.

THE JACKAL WOLF.

The JACKAL WOLF, *Canis lupaster*, is found in the whole North, North-east, and North-west of Africa. It is smaller than the common wolf, which it resembles more closely than it does the jackal. It usually confines itself to a limited range of country, in which it chases hares, mice, wild-fowl and the like, as well as devours fruit of all sorts; during the rainy season it forms considerable packs, and attacks herds of sheep and goats. In the plains of Central Africa it is hunted by greyhounds which, in spite of the wolf's energetic defence, pull it down, or keep it at bay till the huntsman has the courage to come up and give the marauder the finishing stroke with his spear.

THE AMERICAN WOLF.

The GRAY WOLF, *Canis occidentalis* (Plate XVII), is covered with long and fine fur; its form is more robust than the European, its muzzle thicker and more obtuse, its head larger and rounder, its forehead more arched, its ears shorter and wider. In the European Wolf the fur is coarser, with less of soft wool under the long hair, and its tail is more thinly clothed with fur.

The body of the Gray American Wolf is long and gaunt, muzzle elongated, head thick, nose long, ears erect and conical, the eyes oblique, the pupil circular, the tail straight and bushy.

In Gray's classification it represents the genus *Urocyon*.

The LOBO, *Canis occidentalis*, var. *gigas*, is regarded by Audubon as identical with the Common Gray Wolf. He relates that some hunters with a pack of half a dozen fox-hounds struck the trail of a Giant Wolf near Fort Gibson. He dashed boldly into the prairie, making a straight course for the hills on the other side, a distance of three miles. Here he took cover, and when dislodged again took to the plain. In this way he made bold dashes from cover to cover, till at the end of five hours he was brought to bay.

A desperate fight then ensued, dog after dog recoiled more or less injured till, when all the combatants were exhausted, and the hunters could at last distinguish in the crowd which was dog and which was wolf, the latter was knocked on the head with a heavy club.

Col. McCall says the striking marks of distinction in this variety are the size and breadth of the head, and the smallness of the tail; the former forms nearly an equilateral triangle, the latter is short and scant of hair.

The BLACK WOLF, *Canis occidentalis*, var. *ater* (Plate XVII), is found chiefly in Florida at present; but Audubon saw it in considerable numbers during his residence in Kentucky. At one time he was with a planter who had taken three wolves in a pit, and was astonished to see his friend coolly jump down and hamstring the beasts, which were then dragged out and given to the dogs. On another occasion he saw a beautiful black wolf following its owner, who assured the naturalist that no dog could trail deer better. He tells, however, a story of an attack by black wolves on negroes. Both fought bravely, but soon one of the negroes ceased to move, and the other, despairing of aiding his comrade,

took refuge in a tree. In the morning he found the bones of his friend scattered on the snow, which was stained with his blood.

Audubon considers the dusky wolf and the black wolf the same.

The WHITE WOLF, *Canis occidentalis*, var. *albus* (Plate XVII), used to be exceedingly common on the plains, consorting in large bands with the Coyote, and is large, stout, and compactly built.

This variety of wolf is found as far north in the Arctic regions as they have been traversed by man. A white wolf was killed in Erie county, N. Y., at the beginning of this century, but they do not appear on the Atlantic coast. A very considerable degree of cold seems necessary to produce wolves of the white variety.

Audubon remarks that the wolves in the North are mostly white, in the Middle States and on the Atlantic Coast gray, in the South and Florida, black, in Texas and the Southwest, red. "It is difficult," he adds, "on any principle of science to account for this remarkable peculiarity."

The RED WOLF OF TEXAS, *Canis occidentalis*, var. *rufus* (Plate XVII), in shape resembles the common gray wolf, but is more slender and lighter than the white wolf, with a more cunning fox-like look. The hair on the body is not woolly, but lies smooth and flat. The color is reddish-brown mixed with irregular patches of black, there is a brown stripe on the fore-legs extending from the shoulders to the paws; the end of the tail is black for about three inches.

It is by no means the only variety found in Texas, but it does not inhabit the northern prairies, or even the lower Mississippi bottoms. Its habits are nearly similar to those of the black and the white wolf.

It is said that when visiting the battlefields of Mexico, the wolves preferred the Americans to the Mexicans, and only ate the bodies of the latter from dire necessity, as, owing to the quantity of pepper used by the Mexicans in their food, their flesh is impregnated with that powerful stimulant. No corpse of wounded straggler, or of unfortunate traveler butchered by the Comanches is ever neglected by the prowling wolf.

THE PRAIRIE WOLF.

The PRAIRIE WOLF, *Canis latrans* (Plate XVII), has a full, bushy tail like a wolf, and a sharp muzzle like a fox. The neck is short and powerful, the head thin; the eye is light-brown with a round pupil. The color is a dirty-gray, passing into a blacker tint on the back; the tail is

deep black at the tip. Full-grown, it measures about four feet and a half. This wolf is found on the plains of the West, where it is erroneously called the Coyote.

The Prairie Wolf digs its burrow upon the prairies or some slight elevation, to prevent them from being filled with water. These dens have several entrances, like those of the Red Fox. Their howl resembles so closely the bark of a dog, that they deserve their alias of "Barking Wolves." They display considerable intelligence, and no sooner is the report of a gun heard than they all assemble around the hunter in anticipation of a meal. They are always found on the outskirts of the herds of buffaloes, and pick up a subsistence by assailing the weak or wounded members of the herd. In captivity the animal displays all the qualities of the common dog; it knows its master, wags its tail, and leaps up in joy at his approach; like a dog, it shows a quick understanding of different sounds and words—shrinking when spoken roughly to, and being moved to lamentable howls if addressed in a melancholy tone.

THE COYOTE.

The COYOTE, *Canis ochropus* (Plate XVII), is seldom seen except in Texas and Mexico. It is a miserable little cur of an animal, scarcely larger than a fox, and is sometimes called the "Indian Fox." It has a wolfish head, large eyes, small sharp ears, a long, black, slender muzzle, and a very rough, thick tail.

THE SOUTH AMERICAN WOLVES.

The AGUARACHAY, *Canis Azaræ*, is a real link between the jackal and the fox. This species is found from the Equator to Patagonia, from the Atlantic to the Pacific. It is said to follow the jaguar as the jackal follows the lion, and to devour what the more powerful animal has left. When hunting by itself it shows great cunning, making long circuits till it comes near an unsuspecting victim, and prowling around the farmyards even by day; it causes great damage, not only to the poultry but to the sugar-canes, which it bites off close to the root—the place which, its experience tells it, contains most sugar.

It is, when caught young, easily tamed, learning to know its master and answer to its name, and assisting him in the chase, in which it exhibits great keenness of smell and remarkable perseverance.

THE CRAB-EATING WOLF.

The CRAB-EATING WOLF, *Canis cancrivorus*, or MAIKONG, is a slender, long-legged, jackal-like animal, with a short, broad, blunt-nosed head. rounded ears of moderate size, placed wide apart, oblique eyes with oblong pupils, and a tail nearly touching the ground. It attains the length of two feet in the body, with a tail of nearly one foot. The coat consists of moderately long rough hairs, which cover completely the woolly under-coating; the color is a fawn-gray, darkened on the back and shoulders by black-tipped hairs, and becoming nearly pure white below.

The Spaniards are said to have found this creature domesticated among the natives when they landed on the Antilles; it is no longer found in the islands, but is common in the woody plains that border the rivers of Guiana, where it lives and hunts in large bands.

The Maikong, in its habits and behavior, completely corresponds to the jackal of the Old World, and in captivity soon becomes tame.

The epithet "Crab-eating" is as old as Buffon and Linnæus, but is somewhat misleading, as the animal by no means confines itself to a crustacean diet. Schomburgk describes it as preying on the smaller rodents, and as being a terrible plunderer of the hen-roosts of the settlers. It is often crossed with the dog by the Indians, and the breed thus produced is highly prized.

THE RED WOLF.

The RED or MANED WOLF, *Canis jubatus*, is less powerfully built than the common wolf, and has longer legs, a narrower muzzle, and a shorter tail. Its color is a clear reddish-brown. This wolf is found in most parts of South America, and is particularly frequent in Brazil, Paraguay, and the Argentine Republic. It is very timid and avoids settled districts, and hence is little known. Its long legs give to it the power of making very long leaps, by which it overtakes its prey. When walking it has the swinging gait of a Newfoundland dog, and is a good swimmer.

Gray forms the Red Wolf and Coyote into a separate genus which he calls by the name of *Chrysocyon*.

CHAPTER X.

THE JACKALS AND FOXES.

THE JACKAL—THE LANDJAK—THE COMMON FOX—THE RACCOON DOG—THE CORSAC—THE CAAMA—THE FENNEC—THE AMERICAN FOXES—THE RED FOX—THE SILVER OR BLACK FOX—THE CROSS FOX—THE KID FOX—THE GRAY FOX—THE ARCTIC FOX—THE BLUE FOX—THE LARGE-EARED FOX—THE HUNTING DOG.

BETWEEN the Wolves which we have just described, and the Foxes which we shall soon treat of, stands the Jackal; it differs to such an extent from both, that Gray has placed it in a separate genus, *Dicba*, so called from its Arabic name, *Diab* “the howler.”

THE JACKAL.

The JACKAL, *Canis aureus* (Plate XVII), is known everywhere in Asia, where it is regarded very much as the fox in our fairy tales, and is found also in Greece and Dalmatia. It is rather larger than the fox, and its coat is of a grayish-yellow color, the tail being tipped with black.

The jackals resemble the fox more nearly than they do the wolf. They conceal themselves by day, but roam at night, usually in large packs. To keep together they are constantly howling, and their voice is sad, loud, and unmusical. Their voracity and audacity are unparalleled. They enter habitations, when opportunity presents itself, and sweep off everything eatable they can reach; devouring even boots, horse-harness, and other articles made of leather. In the desert they follow the caravans, prowl all night around the encampment, and endeavor to carry off anything chance may throw in their way. Like the hyænas, they disinter the dead, and the natives of the districts in which they are found are obliged to protect the graves from their outrages by covering them with heavy stones and prickly bushes.

The jackals hunt the antelope, gazelle, and other small animals, and in large packs will attack oxen and horses. They fear man, and the

stories of women and children having been devoured by them are mere fables. Equally fabulous is the notion that assigns to the jackal the duties of being the lion's purveyor; it is rather the lion's parasite, and follows the nobler creature in order to get the remains of his meal. The story that the jackal gave the lion notice of prey, was taken by Aristotle from an Indian fable, and was borrowed from him by later writers.

When taken young the jackal is easily tamed, and becomes more domesticated than the fox, exhibiting most of the characteristics of the dog. Like the dog, it is subject to rabies.

The LANDJAK, *Canis pallipes*, is a species found in Nepaul and Northern India, resembling in its habits the common jackal.

The BLACK-BANDED JACKAL, *Canis mesomelas*, is by some writers classed with the foxes. It is an inhabitant of Southern Africa, and is sometimes called the CAPE JACKAL. It is distinguished from the common jackal by the black and white mottlings of its fur.

The traveler Burton remarks that among the Somali the morning cry of this jackal is used as an omen of good or evil, according to its direction and its tone. He also mentions that it is in the habit of attacking the peculiar fat-tailed sheep which inhabit that country, and carrying off their lambs. The fat-burdened tail forms an article of diet which seems to be greatly to the jackal's taste, and which he procures by leaping suddenly upon the poor sheep, and then making a fierce bite at its tail. The terrified sheep starts off at best speed, and leaves a large mouthful of its tail between the aggressor's teeth. Kids and other small animals fall victims to this insatiate devourer.

THE FOX.

The foxes are distinguished from the wild dogs, wolves, and jackals by their long bodies, sharp-pointed heads, and by the possession of oblong pupils to their eyes; the tail is very bushy, and most of the species exhale an unpleasant odor.

The COMMON FOX, *Canis vulpes* (Plate XVIII), is found throughout Europe, where it enjoys an immense reputation for cunning, which he displays equally in prosecuting his robberies on the poultry-yard of the farmer and in his endeavors to throw his pursuers on a false track. Like some of the wolves, he will feign death when surprised by the hunters and there is no hope of safety in flight.



WHITE WOLF
BLACK WOLF

RED WOLF
PRAIRIE WOLF

PLATE XVII CARNIVORA

GREY WOLF
COYOTE
JACKAL

The fox is unsocial, and never hunts in packs; he therefore never attacks powerful animals. Birds, hares, or rabbits form his customary diet, but he does not dislike certain fruits; for grapes it exhibits a great fondness.

In the north of the continent of Europe and in England the color of the fox is red; but as we proceed southward we find both gray and black foxes, till in Spain he becomes small and fawn-colored. The fox resides in burrows, which it scoops out of the earth by the aid of its paws, winding its way among the roots of large trees or between heavy stones. Here the vixen, or female fox, produces and nurtures her cubs, which she educates with great care.

In England fox-hunting is the favorite sport of the wealthier classes, and its headquarters are in the county of Leicester. The soil being for the most part good, is highly favorable for scent; there is an immense proportion of grazing land in comparison with arable, and the enclosures are large, the fields running up to one hundred acres each. Large woods are scarce, while natural covers of gorse abound. In addition to these, artificial covers are sometimes made with stakes set a certain height from the ground for the grass to grow over them; but these are far inferior to those of natural brushwood. Usually from twenty to twenty-five couples of hounds are taken out, and it is the custom, quite necessary in these days, for each sportsman to have two horses, the second one being ridden by a groom well acquainted with the country, who rides his horse slowly and carefully, not following the hounds, but seeking to meet his master at some favorable point and give him an opportunity to change horses.

A meet of Fox-hounds is a very pretty sight; the numerous carriages that bring the sportsmen to the field, the magnificent horses that are being walked about till the sport begins, the scarlet coats of the riders, the strong yet graceful forms of the hounds, form a scene almost impossible to describe.

Let us indulge ourselves with a fine morning in the first week of February, and at least two hundred well-mounted men by the cover's side. Time being called—say a quarter past eleven, nearly our great-grandfathers' dinner-hour—the hounds approach the furze-brake, or the gorse, as it is called in that region. A cheer and a wave of the master's cap sends the dogs into the cover. In a very short time the gorse appears shaken in various parts of the cover—apparently from an unknown cause, not a single hound being for some minutes visible. Pres-

ently one or two appear, leaping over some old furze which they cannot push through, and exhibit to the field their glossy skins. Two minutes more elapse; another hound slips out of cover, and takes a short turn outside, with his nose to the ground and his stern lashing his side—thinking, no doubt, he might touch on a drag, should Reynard have been abroad in the night. Hounds have no business to think; a crack of the whipper-in's thong sends the too enthusiastic animal back to its work. Soon the cover shakes more than ever. Every stem appears alive, and it reminds us of a corn-field waving in the wind. In two minutes the sterns of some more hounds are seen “flourishing” above the gorse. In an instant a hound challenges—and another—and another. The fox breaks out; “Tally-ho,” cries some countryman, and the chase has commenced. The whole pack, the whole crowd of horsemen is after him. If the hounds are pressed too hard by the riders, they are apt to overrun the scent and come to a fault. It is now the duty of the huntsmen to recall them. At one blast of his horn they are back at the place where the scent failed; it is again taken up, and all that are left of the field are again dashing forward; but the number of men up with the hounds soon diminishes, not only are many of the horses unable to keep up with the speed of the leaders, but many of the riders have not the nerve to face the fences, brooks, or posts and rails which have to be surmounted without a pause.

The pencil of a painter is now wanting; and unless the painter should be a sportsman, even his pencil would be worth little. What a country is before him!—what a panorama does it represent! Not a field of less than forty—some a hundred acres—and no more signs of the plough than in the wilds of Siberia. See the hounds in a body that might be covered by a damask table-cloth—every stern down, and every head up, for there is no need of stooping, the scent lying breast-high. But the crash!—the music!—how to describe these? Reader, there is no crash now, and not much music. It is the tinker that makes great noise over a little work; but at the pace these hounds are going there is no time for babbling. Perchance one hound in five may throw his tongue as he goes, to inform his comrades, as it were, that the villain is before them. The fox shows signs of distress; his coat becomes darker, his pace slower; the dogs run into him, and all is over.

The maintenance of a pack of Fox-hounds is an affair involving considerable expense. The master of one, hunting four days a week, must

spend on his hounds and stable not less than \$20,000 a year. To this must be added the cost of maintaining covers for the foxes, and a stock of game and rabbits for their food, as well as the cost of earth-stopping, an operation which has to be performed on the evening before the chase.

The fox is susceptible of being tamed to a certain extent, but it seems impossible to eradicate entirely its instincts for plunder. Its cunning is no doubt great, but has been very much exaggerated by popular imagination, in which there still linger reminiscences of the astuteness ascribed to him in the great beast-epic of "Reynard the Fox," which had unexampled popularity in the Middle Ages, and which Goethe did not disdain to modernize for our age. The subjoined story evinces the possession of considerable intelligence.

Two foxes, located in a neighborhood where hares abounded, adopted an ingenious stratagem for capturing them. One of them lay in ambush on the side of a road; the other started the quarry and pursued it with ardor, with the object of driving the game into the road guarded by his associate. From time to time, by an occasional bark, the associate in ambush was notified how the chase was succeeding. When a hare was driven into the road, it was immediately pounced on, and both foxes devoured it in thorough good-fellowship. Nevertheless, it sometimes happened that the fox who kept watch miscalculated his spring, and the hare escaped; then, as though puzzled at his want of skill, he resumed his post, jumped on to the road, and several times repeated the movement. His comrade arriving in the middle of this exercise, was not slow to comprehend its meaning, and irritated at being fatigued to no purpose, chastised his clumsy associate; but a tussle of a few minutes sufficed to expend the bad humor, and the *entente cordiale* was quickly re-established.

THE RACoon DOG.

The RACoon DOG, *Canis procyonides*, is very like a weasel in shape, but has no near allies. The long body rests on short, weak legs; the head is short, narrow, and pointed; the tail very short and bushy; the color is dark-brown; the under fur is very thick, but the long hair is as rough as the coat of a badger.

This species is found in Japan and China, and is not rare on the tributaries of the Upper Amoor River. It is shy and timid by day, but by

night will boldly face a dog. It does not run well, nor can it leap like the fox; its voice is a kind of mewling. It is quite omnivorous, eating flesh, fowl, and fish, and vegetables of every kind. Gray places it in a genus *Nyctereutes*.

THE CORSAC.

The CORSAC, *Canis corsac*, is an Asiatic species of fox, considerably less than the ordinary fox, found from Mongolia to the Caspian Sea, exclusively in the steppes, never in woods or hills. It is pursued for the sake of its winter fur, in which a large trade is done with China. The Tartars employ not only dogs to capture the Corsac, but hawks of various kinds, from which winged enemies it has no chance of escaping. The color of the fur in summer is red; in winter more of a fawn-color.

THE CAAMA.

The CAAMA, *Canis caama*, is an inhabitant of Southern Africa, where it is in great request for its fur, which is highly esteemed by the natives for the purpose of making "karosses," or mantles. As the Caama is one of the smallest of the foxes, a great number of skins are needed to form a single mantle, and the manufactured article is therefore held in high value by its possessor. Indeed, so valuable is its fur, that it tempts many of the Bechuana tribes to make its chase the business of their lives, and to expend their whole energies in capturing the animal from whose body the much-prized fur is taken.

THE FENNEC.

The FENNEC, *Canis zerdo* (Plate XVIII), is the most graceful of the foxes. Its face is refined and sly, and embellished by a pair of unusually large eyes, and by large, wide ears. Its legs are very fine, and support a slender, supple body terminating in a bushy tail; everything about it indicates activity, intelligence, and acuteness of sense. Nothing escapes its notice; grasshoppers, lizards, small birds are betrayed by their slightest motions or softest notes. The Fennec is the smallest of all the foxes. It measures, including the tail, about two feet; the head is very pointed: the large eyes have round pupils; the ears are nearly as long as the head. It inhabits the whole north of Africa.

The Fennec burrows in the earth, forming a den with many passages, in which it sleeps by day, rolled up with its head under its tail. At sunset it leaves its home and seeks some spring, where it drinks eagerly before proceeding on its nocturnal chase. Small birds are its favorite food, but it is also very fond of fruit, especially that of the date-palm, which it is said to possess the capability of climbing.

THE AMERICAN FOXES.

The RED FOX, *Canis fulvus*, is very plentiful in the Northern fur countries; it has long, fine fur, and has a much finer brush than the European animal. The coat is of a bright ferruginous color on the head, back, and sides; the throat and neck a dark-gray; the tail is not tipped with white.

In summer it burrows, in winter it shelters under a fallen tree; it preys on the smaller animals of the rat family and is fond of fish, but rejects no animal food it can find. It runs for about a hundred yards with great swiftness, but is easily overtaken by a wolf or a mounted man.

THE SILVER FOX AND THE CROSS FOX.

The SILVER or BLACK FOX, *Canis fulvus*, var. *argentatus* (Plate XVIII), supplies one of the most valuable furs of the world, surpassing in richness and beauty those of the beaver or sea-otter. The outer hair, which is in some places two inches longer than the under fur, is soft, glossy, and fine; the under fur is unusually long and dense, feeling to the hand as soft as sea-island cotton, and the separate hairs exhibit a crimped or wavy appearance. This under-fur is uniformly blackish-brown; the long hairs are brown at the roots, then silver-gray, and then tipped with black; the tail is brownish-black to near the extremity, where it is broadly tipped with white.

The Silver Fox is by no means abundant, and presents considerable variations in color. Some skins are brilliant black, with the exception of the white tip to the tail; others are bluish-gray. This white tip of the tail is a characteristic of the variety.

The CROSS FOX, *Canis fulvus*, var. *decussatus*, is considered by Richardson a mere variety of the Red Fox. Its fur is nearly six times more valuable than that of the latter; the front of the head is gray, the ears

covered with soft black fur behind; the back ferruginous, with dark stripes, one running from the head longitudinally, the other at right angles over the shoulders; the rest of the back is gray, the sides a pale rusty-red, the legs and belly black. The fur is thick and long.

THE KIT FOX AND THE GRAY FOX.

The KIT FOX, *Canis velox* of Audubon, the *Canis cinereo-argentatus* of Richardson, is very like the Red Fox in shape, but approaches the Gray Fox in color; its form is slight and slender; the tail long, bushy, and tapering. It is the smallest of the American foxes; the back is of a grizzled color, the flanks of a dull reddish-orange, the belly is white. It is found on the plains of the Columbia River valley, and on the plains east of the Rocky Mountains; it does not appear to be an inhabitant of New Mexico, Texas, or California.

The GRAY FOX, *Canis Virginianus* or *griseus*, has a shorter and broader head than the Red Fox. The long hairs which give the general color to the body are white at the roots, then for more than a third of their length black, then white, with a broad black tip. This color varies somewhat, specimens from New York State being more fulvous than those from South Carolina.

The Gray Fox is in the South what the Red Fox is in the North—the detestation of farmers. Audubon asserts that the former is by no means rapacious; that he is shy and cowardly, and only preys on creatures much weaker than himself. He hunts quail or partridges just as a pointer dog will do, and runs down rabbits, and it is very fond of making raids on the nests of the wild turkey.

Till within a couple of years fox-hunting in America was exclusively a Southern sport, extending from Maryland to Florida and westward to Louisiana. It is now, however, being taken up in different sections of the Northern States. The hounds are put on the fox's trail near some cover, but it requires good dogs to follow him, as he does not leave so strong a scent as the Red Fox and possesses more cunning.

THE ARCTIC FOX AND THE BLUE FOX.

The ARCTIC FOX, *Canis lagopus* (Plate XVIII), is of a pure white color when in its winter dress, except at the tip of the tail, where a few



COMMON FOX
TENREC

ARCTIC FOX

BLUE FOX

SILVER FOX

PLATE XVIII CARNIVORA

black hairs are sprinkled. The fur before the eyes is short and sleek; on the neck it is as long as the ears, and is intermixed with soft wool; on the rest of the body it is very long. In most specimens the fur has a bluish-gray color at the roots, the proportion of the length of the fur so colored varying according to the season; at all times the under fur is of a dark brownish-gray color for half its length. In summer the long white fur falls off, and is replaced by shorter hair more or less colored, although individuals may at times be found so eccentric in their tastes as to preserve their winter suit till the dog-days; this is the *kakkortak* of the Greenlanders. In form the Arctic Fox resembles the common fox; the brush is full and large, covering the nose and feet like a muff when the animal sleeps. The eyes are hazel-colored and bright, the legs are long and strong, the feet large and armed with strong claws, and the animal can make powerful leaps.

The Arctic Fox is very cleanly, and does not exude an unpleasant odor; it is very difficult to come upon unawares, as it seems to sleep with both eyes open; its bark is so modulated that the hearer thinks the animal at a distance when it is close before his feet. It is very impatient of confinement. It inhabits North America above latitude 50°, and is numerous on the shores of Hudson Bay. The fur is of small value; the flesh is eatable.

The BLUE FOX, *Canis lagopus*, var. *fuliginosus* (Plate XVIII), is a mere variety of the Arctic Fox, and is to be distinguished from the Black or Silver Fox by its round ears and poor fur, which differs from the ordinary winter or summer states of the Arctic Fox in being entirely of a uniform blackish-brown color. It is called by the Greenlanders *kekucktak*, and is very numerous in Iceland. Audubon observed two Blue Foxes which came to the place where he had been cooking; they carried off the scraps of meat and buried each piece in a separate place. The Arctic Fox has the same habit; and the domestic dog, as we all know, still retains these primitive uneducated instincts.

II.—GENUS MEGALOTIS.

The animals hitherto described are so essentially similar that we have followed those authorities who place them all in one genus. We now proceed to consider others which display such marked differences as entitle them to be placed in separate genera.

The LARGE-EARED FOX, *Megalotis Lalandii*, has a slender figure, long legs and tail, large oval ears, and forty-eight teeth; it attains the length of three feet, of which one-third is tail, and externally bears a strong resemblance to the Fennec. The predominant color is a dull-gray, except on the tail, where it has long black hair. It is a native of South and Eastern Africa, hunts in packs, and succeeds in pulling down antelopes or even wild cattle.

III.—GENUS LYCAON.

We now come to a link between the *Canidæ* and the *Hyænidæ*—the remarkable animal which has been, indeed, placed by some naturalists among the hyænas, as, like the latter, it possesses only four toes on its feet. The genus contains only *one* species.

The HYÆNA or HUNTING DOG, *Lycaon pictus*, derives its former title from its hyænine aspect, the latter from the fair and sportsmanlike manner in which it hunts its game. The general color is a reddish or yellowish-brown, marked at wide intervals with large patches of black and white. The nose and muzzle are black, and the central line of the head is marked with a well-defined black stripe, which reaches to the back of the head. The ears are extremely large, and are covered on both their surfaces with rather short black hairs. From their inside edge rises a large tuft of long white hair, which spreads over and nearly fills the cavity of the ear. The tail is covered with long bushy hair.

Although very fond of putrid flesh, these dogs do not make it their exclusive aliment; for they also feed on living prey, such as gazelles and antelopes. To pursue and capture these they collect in troops, which are sometimes very numerous, and under the direction of a chief, when they hunt with a unanimity and cleverness unsurpassed by the best pack of hounds. When the game is taken they divide it equally; but if any of the larger Carnivora approach to take a share in the feast, all unite against the intruder. This often happens with respect to the leopard, and even the lion.



CHAPTER XI.

THE DOG.

THE WILD DOGS—THE DHOLE—THE ALPINE WOLF—THE DOMESTICATED DOG—REGARD IN WHICH THE DOG IS HELD—ABHORRENCE OF THE DOG BY THE ORIENTALS—THE DOGS OF THE EAST—THE DOG IN ANTIQUITY—THE MENTAL QUALITIES OF THE DOG—ITS MORAL SENSE—ITS AFFECTION FOR ITS MASTER—RABIES OR HYDROPHOBIA.

BEFORE we describe the Domesticated Dog, we must say a few words respecting the dogs which still live a free, independent life. In them we see what the dog was before he devoted himself to the human race. They represent the original, the Domestic the modified, or, we may say, the humanized animal.

Gray forms the following species into a genus which he calls *CUON*, the members of which possess forty teeth. They are dog-like wolves. The head is broad, the muzzle short, the ear erect and high, the eyeball round, the body powerful, the flanks thin, the tail bushy and drooping. They are all animals fond of the chase and skillful in hunting.

THE DHOLE.

The DHOLE, *Canis Dukhuncensis* (Plate XIV), sometimes called the KHOLSAM, inhabits the western parts of India; it is a very shy animal, and avoids man and his dwelling-places. The Dhole is remarkable, not merely for hunting in packs—as many of the *Canidæ* do—but for the possession by the pack of such confidence in its own powers that it will give chase to the tiger. The boar falls a victim in spite of its tusks, the antelope in spite of its swiftness, and the panther finds its only safety in taking refuge in a tree.

The color of the Dhole is a rich bay, and it stands as high as a small greyhound. It hunts mute, and has a very intelligent face.

The BUANSUAH, *Canis Primæus*, is found in Nepaul and Cashmere, and resembles the Dhole in almost all points. He gives tongue during the chase; his note is peculiar—quite different from that of a dog, and equally remote from the long howl of the wolf or jackal.

The ADJAG, *Canis Sumatrensis*, is found in the East Indian Islands and Japan. In the former they attack the turtles on their nocturnal visits to the land, and travelers have seen on the sand remains of hundreds of these crustacea. They neither bark nor howl, but yelp.

The ALPINE WOLF, *Canis Alpinus*, is a fourth claimant for being the progenitor of the dog. It is found in the mountain regions of Eastern and Central Asia, and is very similar to the Buansuah. The hair is long and stiff, the tail bushy, the color a dull russet.

Near the Amoor River the hunters stand in great dread of this wild dog, and take refuge in a tree when a pack of them appears. In the chase they utter a kind of whining note, and display great speed and cunning, the pack being led by a powerful old dog. A specimen in Berlin is very like a large sheep-dog.

THE DOMESTICATED DOG.

To give the history of the dog would be little less than to trace mankind back to their original state of simplicity and freedom, to mark the progress of civilization through the various changes of the world, and to follow attentively the gradual advancement of that order which placed man at the head of the animal world, and gave him a manifest superiority over every part of the brute creation.

If we consider for a moment the state of man without the aid of this useful domestic, with what arts shall he oppose the numerous hosts of foes that surround him on all sides, seeking every opportunity to encroach upon his possessions, to destroy his labors, or endanger his personal safety? or how shall he bring into subjection such as are necessary for his well-being? His utmost vigilance will not be sufficient to secure him from the rapacity of the one, nor his greatest exertions enable him to overcome the speed of the other. To maintain his independence, to insure his safety, and to provide for his support, it was necessary that some one among the animals should be brought over to his assistance, whose zeal and fidelity might be depended on. And where, amidst all the various orders of animated being, could one be



ESSUINAX

X DANISH DOG
NEWFOUNDLAND DOG, WILD DOG

DANISH DOG
NEWFOUNDLAND

CONCISE

UNIVERSITY

THE COLLEGE

SCOTT & BROWN

PLATE XIV. CARNIVORA.

found so entirely adapted to this purpose? where could one be found so bold, so tractable, and so obedient as the dog? Without his assistance how could man have conquered, tamed, and reduced other animals into slavery? how could he have hunted down and destroyed those noxious animals from whose rapacity his life was in continual danger? To confirm the truth of these observations, we need only turn our attention to the present condition of those nations which are not yet emerged from a state of barbarism, where the uses of the dog are but little known or attended to, and we will find that they lead a precarious and wretched life of perpetual warfare with the still more savage inhabitants of the forest, with which they are obliged to dispute the possession of their uncultivated fields and divide with them the fruits of their labors.

“Through the intelligence of the dog the world exists”; so says the *Vendidad*, the oldest portion of one of the oldest books of the world—the *Zend-Avesta*. “The dog,” writes Frédéric Cuvier, “is the most remarkable, complete, and useful conquest which man has ever made. The whole species is become our property; each individual belongs wholly to his master, learns his habits, knows and defends his property, and remains devoted unto death. And all this springs not from necessity or fear, but from pure love and attachment. The speed and the sense of smell possessed by the dog have made it one of man’s most powerful auxiliaries, and perhaps it is necessary for the maintenance of human society. The dog is the only animal which has followed man over all the world.” Toussenel goes further, and, regarding the dog as an integral part of mankind, exclaims: “The best part of man is the dog.”

In marked contrast to these views is the remarkable loathing with which some of the Semitic nations regard the dog. All through the Jewish Scriptures the dog is always mentioned in terms of abhorrence and contempt, although we know that dogs were domesticated among the Jews, and used to guard the sheep-folds (Job, ch. xxx, v. 1) and to watch the house (Isaiah, ch. lvi, v. 10). This feeling is still felt by most of those who profess the religion of Mohammed. As, however, the Moslemin of Persia on the one side, and of North Africa on the other, are as fond and proud of their dogs as we are, the dislike seems to have its foundation in race rather than in religious feeling. As a consequence of this abhorrence the dog is, in most parts of the East, in a very miserable condition; he is left, uncared for, to wander gaunt, hungry, and savage—to wander through the streets without a master

and without a home, cut off from all companionship with man. But even in this neglected state they exhibit a great capacity for organization; they divide the town into districts, and no dog can be tempted to trespass on a district to which he does not belong; each troop seems to be under the command of a leader, whose position is recognized by all the rest. Pierotti describes the dogs in Palestine to-day as ill-favored, ill-scented, ill-conditioned beasts, but ready to respond to the slightest advance and grateful for any kindness, exhibiting, under circumstances of great social degradation, the true canine yearning after human society. These outcast dogs, of course, have to get their living by devouring the offal of the street.

The question has been raised, "Is the dog a separate, independent species, like the wolf, the jackal, or the fox?" Darwin discusses the matter at considerable length, and comes to the conclusion that the origin of the dog is to be looked for in the taming and crossing of various species of *Canidæ* in various regions. Each race of mankind would train and preserve the animals most suited to his wants, and this process of selection continued for ages would account for all the varieties we know.

The oldest traditions, the most ancient monuments, show us the dog already tamed. The records of the twelfth Egyptian dynasty, B. C. 3400, exhibit several kinds of dogs, several of them resembling greyhounds, or the Arabian boar-hound. The Assyrian monuments, B. C. 640, represent huge mastiffs. Homer describes Odysseus weeping over his old dog Argus, that recognized him after twenty years of absence, when wife and child and friend knew him not; and in all European literature, from that day to this, the dog holds an honored place. Socrates used to swear "By the dog!" Alexander the Great built a temple over the remains of his favorite; at Corinth a dog, Soter by name, was presented by the city with a silver collar inscribed with the words, "Corinth's defender and deliverer." A dog is one of the *dramatis personæ* in a play of Aristophanes; and who does not remember Launce and his dog Crab in Shakespeare's "Two Gentlemen of Verona"? A still more important role is played by the dog in the melodrama "The Dog of Montargis," where he appears as a party in a Wager of Battle, and procures the punishment of his master's murderer.

Volumes have been written respecting the mental and moral qualities of the dog. All dogs have good memories for time and place; they

remember the dinner-hour, and distinguish Sunday from week-days ; and in places where they are in the habit of going to church with their masters, they soon learn to behave themselves and sleep like good Christians. They vary, like the rest of us, in their capacities for acquiring knowledge, and each variety has its special gift. It is still an open question as to how far the dog possesses the faculty of reasoning. It is said that a dog tracking his master has been seen, when he came to where three roads met, to examine two of them carefully, and then at once run along the third ; that is, the dog reasoned, "He must have gone by A, B or C ; but he has not gone by A or B, therefore he has gone by C." A dog, however, if offered a large and a small piece of meat, does not as a matter of course choose the large piece ; from which fact it is assumed that he does not know the axiom "that the whole is greater than its part." It is more probable that he takes the small piece first, as easiest to dispose of, reserving the large piece to occupy his leisure time.

That the dog has a moral sense we all see ; but his moral sense is one suitable to his condition and to promote the chief end of dog, which, to borrow the words of Professor Wilson, is to love man and keep his commandments. A dog taught to steal will become as mean and slouching as his master, and will hate to be detected ; but his wicked conscience does not smite him. A dog virtuously brought up feels keen remorse when he has transgressed the moral code. Dr. Calderwood, in his work "The Relations of Mind and Brain," relates the following story: "A dog belonging to a United Presbyterian minister killed the fowls while the family were at church and buried them in the garden. The bodies were found. The dog was taken to the garden and immediately confessed his guilt. His master took him to his library, and having shut the door, began a reprimand after this fashion : 'What a wicked thing you have done in murdering the hens ! You are a minister's dog, and should have been an example to other dogs instead of doing such a thing as this. Then, this is the Sabbath day, and the deed is all the worse on account of the day on which it has been done.' Thus admonished, the dog was put out of the room and the door shut. Next morning he was found dead. A veterinary surgeon was consulted, and declared that the dog had died of a broken heart."

Of course, duty ignorantly performed sometimes perpetrates injustice. A dog in Haverhill, Massachusetts, met the newsboy every morning at the gate and took his master's paper. When the subscription was

stopped and the boy attempted to pass the house, the dog threw the boy down, and seizing a copy took it to his home.

The affection and devotion of the dog is proverbial, but the extent to which these qualities are developed depends as much on the master as on the dog. They are seen most plainly in those animals which have been not the mere toys or playthings, but the fellow-workers and constant companions of their "guide, philosopher, and friend." There is more than one well authenticated instance of a shepherd's dog accompanying the coffin of its departed friend to the grave and remaining there till its death, either dying of hunger or leaving the spot only long enough to get some food.

Suicides by dogs are not unknown. An old collie in Caithness, troubled with the infirmities of age, including deafness and the loss of teeth, committed suicide by drowning. A Newfoundland dog had his feelings wounded by being scolded. Soon after he was found alive, but with his head partly submerged in a ditch. He was dragged out; but he refused to eat or drink, and before long he was found in the same ditch dead.

Numerous instances are known of dogs calling on their friends to assist them or avenge them. "Liege" was the favorite of his owner, Dr. Van Tuyl, of Dayton, Ohio. One day he tackled a large yellow dog. With ears torn and bleeding, and smarting from defeat, he ran through the house and jumped a fence into an adjoining yard where another dog was quartered. They held some sort of a council, and half a minute later they both cleared the fence and ran into the street, and there, while Liege looked on, his friend gave the yellow dog a wholesome defeat.

We conclude this chapter with a few remarks on that most terrible of all diseases, rabies or hydrophobia. The first symptom of this complaint is an entire change of manner in the animal. The affectionate, caressing dog becomes suddenly cross, shy, and snappish; retreating from the touch of the friendly hand as if it were the hand of a stranger. His appetite becomes depraved, and forsaking his ordinary food, he eagerly swallows pieces of stick, straws, or any other innutritious substances that may lie in his way. He is restless, unable to remain in the same position for two seconds together, and snaps at imaginary objects; and he ever and anon starts up and listens eagerly to imaginary sounds. Generally he utters at intervals a wild howl, but in some cases the dog remains perfectly silent during the whole of his illness, and is then said

to be afflicted with the dumb madness. In most instances the dog is silent during the later stages of the illness.

Before the disease has developed itself to any extent the poor creature becomes thoughtful and anxious, and looks with wistful eyes upon his friends, as if beseeching them to aid him in the unknown evil that hangs so heavily upon him. He then retires to his usual resting-place, and sluggishly lies upon his bed, strangely uneasy, and continually shifting his posture. Fortunately the disposition to bite does not make its appearance until the disease has made considerable progress.

In these stages of the malady the dog is often seen to fight with his paws at the corner of his mouth, as if endeavoring to rid himself of a bone that had become fixed among his teeth. This symptom may, however, be readily distinguished by the fact that the dog is able to close his mouth between the paroxysms of his ailment, which he is unable to do when he is affected by the presence of a bone or other extraneous substance in his throat.

An unquenchable thirst soon fastens upon the afflicted dog, and drives him to the nearest spot where he can obtain any liquid that may cool his burning throat.

In the earlier stages of the complaint he laps without ceasing, but when the disease has destroyed the powers of his tongue and throat, he plunges his head into the water as far as the depth of the vessel will permit, in hope of bringing his throat in contact with the cooling fluid. It is generally supposed that a mad dog will not touch water, and for this reason the malady was termed hydrophobia, or "dread of water"; but it is now ascertained that the animal is so anxious to drink that he often spills the fluid in his eagerness, and so defeats his own object.

In the last stage of this terrible disease the dog is seized with an uncontrollable propensity to *run*. He seems not to care where he goes, but runs for the most part in a straight line, seldom turning out of his way, and rarely attempting to bite unless he be obstructed in his course; and then he turns savagely upon his real or fancied assailant, and furiously snaps and bites without fear or reason.

The average time of the appearance of this disease after the bite is from three weeks to six months, its duration is four or five days, and no remedy has been as yet discovered.

With regard to people bitten by rabid animals, the wound ought to be immediately cauterized, either with lunar caustic or by a red-hot iron,

such as a steel fork or knitting-needle. Many persons assert that hydrophobia in man is purely a disease of the imagination; this is not the case, as Hertwig has produced the genuine canine rabies in dogs by inoculating them with the virus from a man suffering from hydrophobia. But it is beyond doubt that very many people fall victims to their own terrors, and therefore everything which tends to excite alarm ought to be carefully avoided when the sufferer is nervous or excitable. *Do NOT kill the dog on suspicion; keep it carefully till its condition is clearly ascertained; by destroying it at once we are left in a state of uncertainty as to whether it is mad or no, and the nervous sufferer will always adopt the worst alternative; by preserving it we shall be able to give the most positive assurances in most cases that the animal is not mad.*

The number of puppies which the dog produces at a single litter is very large, varying from three or four to fifteen, or even a still greater number. They are born, as is the case with kittens and several other young animals, with closed eyes, and do not open their eyelids for the space of several days. As it is manifestly impossible for the mother to rear the whole of a very large family their number must be reduced, either by destroying several of the little ones, which of course ought to be the weakest and smallest specimens, or by removing the supernumerary offspring and placing them under the care of another dog which has lately taken upon herself the maternal duties. In this case it needs not that the wet-nurse should be of the same kind with her charge, as it is found that health of constitution and a liberal supply of milk are the only necessary qualifications for that responsible office.



CHAPTER XII.

THE SPORTING DOGS.

MODES OF CLASSIFICATION—SPORTING DOGS—THE SCOTCH GREYHOUND—THE IRISH GREYHOUND
—THE AFRICAN GREYHOUND—THE COMMON GREYHOUND—THE HARE INDIAN DOG—THE
ITALIAN GREYHOUND—THE STAG HOUND—FOX HOUND—HARRIER—BEAGLE—THE OTTER
HOUND—THE DACHSART AND TURNSPIT—THE BLOODHOUND—THE POINTERS AND SETTERS
—THE SPANIELS—SPRINGERS—COCKERS—WATER SPANIEL—CHESAPEAKE BAY DOG—RETRIEVER.

VARIOUS classifications of the numerous varieties of the dog have been proposed. Some have grouped them into "dogs that hunt by sight," of which the Greyhound is the type; "dogs that hunt by scent," of which the Fox-hound or Bloodhound is the type; "Shepherd Dogs," "House Dogs," and "Toy Dogs"—a division based on habits impressed on the animal by education or the use to which man has put them, and not on any natural characteristic. Cuvier groups them according to the shape of the head, and forms them into three large classes: the *Matins*, including the Great Danish Dog, the different varieties of Greyhound, the Shepherd's Dog, and the St. Bernard; the *Spaniels*, comprising the Esquimaux Dog, the Common Spaniels, Hounds, Pointers and Setters, with the Turnspit and the Newfoundland Dog; and thirdly, the *Mastiffs*, including the English Mastiff, the Thibet Dog, the Pug, the Bulldog, the Terrier, and Bull Terrier. This arrangement, however, is somewhat confusing. We shall therefore make no pretence to a scientific classification, but describe the most noteworthy varieties in the order which seems to be most simple for the ordinary reader.

THE GREYHOUNDS.

The ROUGH SCOTCH GREYHOUND. There is but one breed of the Scotch Greyhound, although some families are termed Deerhounds, and others are only called Greyhounds. Each, however, from being constantly employed in the chase of either deer or hare, becomes gradually

fitted for the pursuit of its special quarry, and contracts certain habits which render it comparatively useless when set to chase the wrong animal. The Scotch Deerhound is possessed of better powers of scent than the Greyhound, and in chasing its game depends as much on its nose as on its eyes. Although it makes use of its olfactory powers when running, it holds its head higher from the ground than the Greyhound, which only uses its eyes, because this attitude is the best in waiting to pull down his game. It is very difficult, if not impossible, to procure this Deerhound thoroughbred; even the celebrated one, "Maida," possessed by Sir Walter Scott, was a cross with the Bloodhound.

The IRISH GREYHOUND (Plate XIV) is a magnificent animal, much larger than the Scotch Deerhound, many of them being nearly four feet high, but it resembles that variety in shape; it is usually of a fawn-color, with a rough coat and pendant ears. "Stonehenge" writes that the genuine breed is extinct. They were formerly used for hunting the wolf, which animal was exterminated in Ireland during the 1st century.

The RUSSIAN GREYHOUND is also gifted with the power of running by scent, and is employed at the present day for the same purposes which Irish Greyhounds subserved in former times.

Many Russian forests are infested with wild boars, wolves, and bears, and this powerful and swift dog is found of great use in the destruction of these quadrupedal pests. In size it is about equal to the Scotch Greyhound. It is not exclusively used for the chase of the large and savage beasts, but is also employed in catching deer, hares, and other animals which come under the ordinary category of "game." The fur of this dog is thick, but does not run to any length.

The PERSIAN GREYHOUND is slender in make; its ears are pendulous and feathered like a Setter's, the body is smooth, the tail is like that of a silky-coated Setter. It is used for coursing the hare and antelope in the plains, and hunting the wild ass in the rocky hill country.

For the antelope the Greyhound would be no match, and is therefore assisted by the falcon, which is trained to settle on the head of the flying animal, and, by flapping its wings in the poor creature's eyes, to prevent it from following a direct course, and thus to make it an easier prey to the Greyhound which is following in the track. Of this curious mixture of falconry and hunting the Persian nobles are passionately fond.

The AFRICAN GREYHOUND has a silky coat of a cream color, and is highly valued by the Arabs. In the Sahara rich and poor regard him as



FOX HOUND

ST. BERNARD

POINTER

KING CHARLES SPANIEL

BLOOD HOUND

COCKER SPANIEL

PLATE XV. CARNIVORA.

an inseparable companion—the very apple of their eyes; they feed him carefully, and bestow as much care on the purity of his race as on that of their horses. An Arab will go any distance to get a good mate for his dog, and the whelps are attended to affectionately; in fact, General Daumas says the women sometimes suckle them. When he is broken in, he passes the day by his master's side and the night in his bed; he is clothed to protect him from the cold, and is adorned with rich collars hung with amulets to keep off the "evil eye." When the dog dies the women and children lament him like a member of the family; often, indeed, he has been the main support of the family. A dog that can run down a gazelle is valued at the price of a camel; one that can capture a larger antelope is as valuable as a good horse.

THE COMMON GREYHOUND.

It is hardly possible to conceive an animal which is more entirely formed for speed and endurance than a well-bred Greyhound. Its long slender legs, with their whipcord-like muscles, denote extreme length of stride and rapidity of movement; its deep broad chest, affording plenty of space for the play of large lungs, shows that it is capable of long-continued exertion; while its sharply-pointed nose, snake-like neck, and slender, tapering tail are so formed as to afford the least possible resistance to the air, through which the creature passes with such exceeding speed.

In England great attention has for years been paid to the breeding and training of the Greyhound, where it is used for coursing the hare, chiefly in matches.

In actual speed the Greyhound far surpasses the hare, so that, if the frightened chase were to run in a straight line, she would be soon snapped up by the swifter hounds. But the hare is a much smaller and lighter animal than her pursuer, and, being furnished with very short forelegs, is enabled to turn at an angle to her course without a check, while the heavier and longer-limbed Greyhounds are carried far beyond their prey by their own impetus, before they can alter their course and again make after the hare. On this principle the whole of coursing depends; the hare making short, quick turns, and the Greyhounds making a large circuit every time that the hare changes her line. The sport is conducted in this wise: A couple of dogs are held in what is called a pair

of slips by a functionary called the slipper, whose duty it is to let them go at the same moment when a hare is started. The judge, who is the only person allowed to be mounted, rides after the dogs and awards the victory to the one that performs the best, which is by no means the one that kills the hare, but the one which gains most points, such as "first turn," and the like.

The Common Greyhound has varied little in the course of centuries. An old rhyme, which can be traced back to 1496, says this hound should have

The head of a snake,
The neck of a drake,
A back like a beam,
A side like a bream.
The tail of a rat,
And the foot of a cat.

And these are still excellent points. The coat is smooth, firm, and glossy; the favorite colors black, red, or fawn, with black muzzles.

The HARE INDIAN DOG is used by sportsmen on the Mackenzie River to hunt reindeer and moose. Its hair is long and straight, the tail bushy and slightly curved, the color grayish-black. It is remarkable for possessing feet that spread out on the snow, thus preventing the animal from sinking into it. Its height is about two feet.

The ITALIAN GREYHOUND is prized in inverse proportion to its size. Many specimens only weigh six or seven pounds. One of the most perfect dogs of the present day weighs eight and three-quarter pounds, and is fourteen and a quarter inches in height. His color is uniformly black.

Attempts have been made to employ the Italian Greyhound in the chase of rabbits, but its power of jaw and endurance of character are so disproportioned to its speed that all such endeavors have failed. A mixed breed between the Italian Greyhound and the Terrier is useful enough, combining endurance with speed, and perfectly capable of chasing and holding a rabbit.

In this country it is only used as a petted companion, and takes rank among the "toy-dogs," being subject to certain arbitrary rules of color and form, which may render a dog worthless for one year through the very same qualities which would make it a paragon of perfection in another. If of a uniform color, it must be free from the least spot of

white; the favorite color is a golden fawn. It is a pretty little creature, very active and graceful, and by no means devoid of affection. It is chiefly bred in Spain and Italy.

THE HOUNDS.

The ENGLISH STAG HOUND is extremely rare. It was a cross between the Bloodhound and the Greyhound with a dash of the Fox-hound, but the dog now used in England is simply a large breed of Fox-hound.

The FOX HOUND (Plate XV) is the result of two centuries of careful breeding, conducted regardless of expense and under the guidance of great judgment. Beckford describes the perfect Hound thus: "Let his legs be straight, his feet round and not too large, his breast wide, his chest deep, his back broad, his head small, neck thin, tail thick and bushy"; to which ought to be added, "the thigh long, the back ribs deep." His height varies from twenty to twenty-five inches, and a larger or smaller breed is chosen according to the quality of the country in which it is employed. The Fox-hound has excellent scent, is swift of foot, and persevering in character. In a trial at New Market, a Fox-hound ran four miles, one furlong, and one hundred and thirty-two yards in eight minutes and a few seconds.

The HARRIER, so called because it is employed in hunting the hare, is nothing else than a small Fox-hound, standing about eighteen inches high. He requires a more delicate scent than the Fox-hound in order to follow the doubles of the hare, and is possessed of a more musical note. Both the Fox-hound and the Harrier must be looked on not as individuals, but as component parts of a pack; and hence an animal invaluable in one, will be inadmissible in another pack.

The BEAGLE is smaller than the Harrier, standing about fourteen inches high, with a body comparatively stouter. The Beagle has no great speed, and is followed on foot; hence his chief point is his highly developed powers of scent and sagacity in tracking the hare. A dwarf variety is used for hunting rabbits; these Beagles are sometimes so small that a whole pack can be carried in hampers on a horse. The ROUGH BEAGLE is a cross with the Terrier, and has lost the Beagle's tongue.

The OTTER HOUND or WELSH HARRIER is a Harrier which, by careful selection, has been adapted to hunt the hard-biting otter. He is hardy, courageous, and unusually savage. When he bites he does not retain

his hold, but tears his teeth away with great force. His coat is rough and long, with a short, woolly undercoat, which keeps it warm even when immersed for a long time.

The DACHSHUND is one of the most ancient forms of the dog. The well-bred specimens weigh about sixteen pounds, have a long body with a curved back, short crooked forelegs, large head with hanging ears; the tail is thick at the root, but tapers off and is carried to one side; the hair is short, smooth, and stiff; the usual color is black or black-and-tan; the bark is very loud and deep. As their German name implies, they are chiefly used for attacking badgers in their hole.

The TURNSPIT seems a variety of the Dachs which has been condemned to menial labor. At one extremity of the spit was fastened a large circular box, or hollow wheel, something like the wire wheels which are so often appended to squirrel-cages; and in this wheel the dog was accustomed to perform its daily task, by keeping it continually working. As the labor would be too great for a single dog, it was usual to keep at least two animals for the purpose, and to make them relieve each other at regular intervals. The dogs were quite able to appreciate the lapse of time, and if not relieved from their toils at the proper hour, would leap out of the wheel without orders, and force their companions to take their place and complete their portion of the daily toil. The thoroughbred Turnspit is very rare, although spits are said by travelers to be still turned by canine labor in some parts of France.

The BLOODHOUND (Plate XV) derives his name from his power of scenting blood, and his proper use is to single out a wounded deer from the herd, and to keep steadily on the trail; when thus engaged he utters a long, loud, and deep bay. His talents were very soon employed to trace human beings, but at present he is used in England only for hunting fallow-deer. A pretty pure breed of Bloodhounds can still be found in some of the Southern States. He is extremely irascible, and therefore not fitted to be a companion. He stands about two feet high; the ears measure eight to ten inches; the forehead is long and narrow; the lips loose and hanging; color black-tan or a reddish-fawn; the tail long and sweeping.

The Bloodhound, when once laid on the scent, will follow the trail through a hundred crossing footsteps, and can be baffled only by water or blood. The latter, if spilt on the track, kills the weaker scent of the fugitive's footsteps, and the former holds no scent.

THE POINTERS AND SETTERS.

The POINTER (Plate XV) has a moderately large head, a high forehead, broad square muzzle, a long neck, strong loins, and wide hips; the tail is strong at the root, then suddenly diminishes, and within two inches of the tip goes off into a point. The shape of the tail is an index of pure breeding.

The Pointer possesses considerable speed, and this quality is specially useful because it permits the sportsman to walk forward at a moderate pace, while his dogs are beating over the field to his right and left. The sagacious animals are so obedient to the voice and gesture of their master, and are so well trained to act with each other, that at a wave of the hand they will separate, one going to the right and the other to the left, and so traverse the entire field in a series of "tacks," to speak nautically, crossing each other regularly in front of the sportsman as he walks forward. When either of them scents a bird he stops suddenly, arresting even his foot as it is raised in the air, his head thrust forward, his body and limbs fixed, and his tail stretched straight out behind him. This attitude is termed a "point," and on account of this peculiar mode of indicating game, the animal is termed the "Pointer."

The SETTER (Plate XVI). As the Pointers derive their name from their habits of standing still and pointing at any game which they may discover, so the Setters have earned their title from their custom of "setting" or crouching when they perceive their game. In the olden days of sporting the Setter used always to drop as soon as it found the game, but at the present day the animal is in so far the imitator of the Pointer that it remains erect while marking down its game.

The ENGLISH SETTER is thus described: "A moderately heavy head, but not so much so as in the Pointer; the muzzle not so broad nor so square in profile, the lower angle being rounded off, but the upper being still nearly a right angle. The eye is similar to that of the Pointer, but not so soft, being more sparkling and full of spirit. The ear long, but thin, and covered with soft, silky hair, slightly waved. The neck is long, but straighter than that of the Pointer, being also lighter and very flexible. The back and loins are hardly so strong as those of the Pointer, the latter also being rather longer; the hips also are more ragged, and the ribs not so round and barrel-like. The tail or 'flag' is usually set on a little lower,

is furnished with a fan-like brush of long hair, and is slightly curled upward toward the tip; but it should never be carried over the back or raised above the level of its root, excepting while standing, and then a slight elevation is admired, every hair standing down with a stiff and regular appearance. The elbow, when in perfection, is placed so low as to be fully an inch below the brisket, making the fore-arm appear very short. The hind-feet and legs are clothed with hair, or 'feathered,' as it is called, in the same way as the fore-legs, and the amount of this beautiful provision is taken into consideration in selecting the dog for his points."

THE IRISH SETTER has lately come into deserved favor. There are two strains—the Red, and the White and Red—the former being the more fashionable. This dog stands higher than the English Setter, and his head is longer and narrower. He is fast and enduring, and works beautifully, but is unreliable.

THE SPANIELS.

The SPANIELS are divided into two classes—the Field and the Water Spaniels; and the Field Spaniels are again divided, according to their work, into Springers and Cockers.

The SPRINGERS are heavy and slow dogs, and the favorite breed at present is the Clumber. This animal weighs about thirty pounds, and stands twenty inches high, with a heavy head and broad, square muzzle, long ears, very long body, with a good barrel; the tail is bushy, the legs well feathered. The Clumber hunts mute, while the Sussex Spaniels give tongue when questing.

The COCKER SPANIEL (Plate XV). This class includes all the other Field Spaniels, and is the original of the Toy Spaniels. The name is given to it because this breed is used for woodcock shooting. The varieties are very numerous; generally speaking, the Cocker is a light dog, of about fourteen pounds in weight. Like the Springer, he keeps his tail down when questing, but moves it to and fro more rapidly. The coat is thick and wavy; the color is plain liver or black, white and black, liver and white, and lemon and white, or nearly all red.

The WATER SPANIEL has great powers of swimming and diving, and is very docile, and is one of the best of outdoor companions.

Much of its endurance in the water is owing to the abundance of natural oil with which its coat is supplied, and which prevents it from

becoming really wet. A real Water Spaniel gives himself a good shake as soon as he leaves the river, and is dry in a very short time. This oil, although useful to the dog, gives forth an odor very unpleasant to human nostrils, and therefore debars the Water Spaniel from enjoying the fire-side society of its human friends.

Some people fancy that the Water Spaniel possesses webbed feet, and that its aquatic prowess is due to this formation. Such, however, is not the case. All dogs have their toes connected with each other by a strong membrane, and when the foot is wide and the membrane rather loosely hung, as is the case with the Water Spaniel, a large surface is presented to the water.

The Water Spaniel is of moderate size, measuring about twenty-two inches in height at the shoulders, and proportionately stout in make. The ears are long, measuring from point to point rather more than the animal's height.

The CHESAPEAKE BAY DOG is very much prized by the duck-shooters of Maryland. There are three breeds—the Otter, with very short hair of a tawny color; the Red, with long hair; the Curly, with curly hair of a reddish-brown hue. The average height is about twenty-five inches.

The RETRIEVER (Plate XVI). In America all shooting-dogs are broken to retrieve; in England this duty is assigned on land to a cross between the Newfoundland and the Setter, or between the Water Spaniel and the Terrier.



CHAPTER XIII.

SHEPHERD'S DOGS AND HOUSE DOGS.

THE SHEPHERD'S DOG—THE COLLEY—THE SPITZ—THE ESQUIMAUX DOG—THE ST. BERNARD—THE MASTIFF—THE THIBET DOG—THE BULLDOG—THE NEWFOUNDLAND DOG—THE BLACK AND TAN TERRIER—THE SCOTCH TERRIER—THE SKYE TERRIER—THE YORKSHIRE TERRIER—THE BULL-TERRIER—THE FOX TERRIER—THE COACH-DOGS—THE PUG—THE POODLE—KING CHARLES—BLENHEIM—THE MEXICAN MOPSEY—THE DINGO, OR THE DOG RELAPSED INTO BARBARISM.

WE now come to the classes of dogs not used for sporting, and commence with the most useful of them.

THE SHEPHERD'S DOGS.

The SHEPHERD'S DOG (Plate XVI) is divided into numerous breeds, all possessing the same general characteristics. It is rather large and powerful, with a thick closely set fur; the muzzle is sharp, the head of moderate size, the eyes intelligent; the shape that of a short, strong greyhound, and there are usually two dew claws on each hind leg.

The SCOTCH SHEEPDOG or COLLEY has a sharp nose, a bright and mild eye, and most sagacious aspect. The body is heavily covered with long and woolly hair, which stands boldly out from its sides. The tail is exceedingly bushy, and curves upwards towards the end, so as to carry the long hairs free from the ground. The color of the fur is always dark, and is sometimes variegated with a very little white. The most approved tint is black and tan; but it sometimes happens that the entire coat is of one of these colors, and in that case the dog is not so highly valued.

It is hardly possible to overrate the marvellous intelligence of a well-taught sheep-dog; for if the shepherd were deprived of the help of his dog his office would be almost impracticable. It has been forcibly said by a competent authority that, if the work of the dog were to be performed by men, their maintenance would more than swallow up the

entire profits of the flock. The Colley is untiring in the discharge of any useful task, but will not display his talents for the idle gratification of spectators.

The SPITZ DOG is one of the commonest house-dogs we see. In its native country Pomerania it discharges the duty of a sheep-dog, and it is fit for nothing else. Its intelligence is of a low order, and its courage is conspicuous by its absence. It has a pointed fox-like head, short legs, and a long tail tightly curled up, and is clad in a thick woolly coat usually of a white color. It has the merit of being a good watch-dog, and with this ends all its good qualities. It is irritable and snappish and therefore unfit to be a playmate for children. Most cases of hydrophobia can be traced to the bite of a Spitz; not that he is more subject to the disease, but that he is more addicted to biting than other dogs.

THE ESQUIMAUX DOG.

The ESQUIMAUX DOG (Plate XIV) is a wolfish-looking creature with oblique eyes, bushy tail and elongated muzzle; its color is a deep dun with obscure bars and patches; its height about twenty-two inches. In winter it is used entirely for drawing sleds and sleighs, but is usually turned loose in the summer. The team of dogs is harnessed to the sleigh by leathern straps, and directed by the voice or the crack of the whip of the driver. The old and experienced animal which leads the team will dash forward, slacken speed, halt, or turn to right and left at the word of command, and the actual stroke of the whip is used as little as possible, for when a dog feels the sting of the biting lash, he turns round and attacks the dog nearest to him. The others immediately join in the fight, and the whole team is thrown into confusion, the traces being entangled with each other, and the sledge in all likelihood upset. When such a rupture occurs, the driver is generally forced to dismount, and to harness the dogs afresh. Usually, the leading dog is permitted to run his own course, for he is able to follow the right path with marvellous accuracy, and to scent it out, even when the thickly-falling snow-flakes have covered the surface of the ground with an uniform white carpet.

These dogs are able to travel for very great distances over the snow-clad regions of the north, and have been known to make daily journeys of sixty miles for several days in succession.

THE SAINT BERNARD AND MASTIFF.

The SAINT BERNARD DOG (Plate XV). These splendid dogs, which belong to the group of Spaniels, are among the largest of the canine race, being equal in size to a large mastiff. The good work which is done by them is so well known that it is only necessary to give a passing reference. Bred among the coldest regions of the Alps, and accustomed from its birth to the deep snows which everlastingly cover the mountain-top, the St. Bernard Dog is a most useful animal in discovering any unfortunate traveler who has been overtaken by a sudden storm and lost the path, or who has fallen upon the cold ground, worn out by fatigue and hardship, and sunk into the death-sleep, which is the result of severe cold. Whenever a snow-storm occurs, the monks belonging to the monastery of St. Bernard send forth their dogs on their errand of mercy. Taught by the wonderful instinct with which they are endowed, they traverse the dangerous paths, and seldom fail to discover the frozen sufferer, even though he be buried under a deep snow-drift. When the dog has made such a discovery, it gives notice by its deep and powerful bay of the perilous state of the sufferer, and endeavors to clear away the snow that covers the lifeless form.

The monks, hearing the voice of the dog, immediately set off to the aid of the perishing traveler, and in many cases have thus preserved lives that must have perished without their timely assistance. In order to afford every possible help to the sufferer, a small flask of spirits is generally tied to the dog's neck.

There are two varieties, the rough and smooth haired, the former of a tawny brindle color, the latter red and white with a broad white collar.

The MASTIFF (Plate XVI) is a noble-looking dog, and when pure bred is remarkably good-natured, and seems to delight in affording protection to the weak, either of men or dogs.

The head of the Mastiff bears a certain similitude to that of the blood-hound and the bulldog, possessing the pendent lips and squared muzzle of the former, with the heavy muscular development of the latter. The under-jaw sometimes protrudes a little, but the teeth are not left uncovered by the upper lip, as is the case with the latter animal. The fur of the Mastiff is always smooth, and its color varies between a uni-



RETRIEVER
BULL DOG
BLACK AND TAN
TERRIER
SETTER
PUG
CHINESE DOG
SKYE TERRIER
MASTIFF
SHEPHERD DOG
COACH DOG

PLATE XVI CARNIVORA

form reddish-fawn and different brindlings and patches of dark and white. The voice is peculiarly deep and mellow. The height of this animal is generally from twenty-five to twenty-eight inches, but sometimes exceeds these dimensions. One of these dogs was no less than thirty-three inches in height at the shoulder, measured fifty inches round his body, and weighed a hundred and seventy-five pounds.

The THIBET DOG (Plate XIV) is an enormous animal employed by the inhabitants of Thibet to guard their houses and flocks. The men journey as far as Calcutta, for the purpose of selling their merchandise, and while thus engaged, they leave their dogs at home, as guardians to the women and children. The courage of these huge dogs is not so great as their size and strength would seem to indicate, for, excepting on their own special territories, they are little to be feared, and even then can be held at bay by a quiet, determined demeanor. Their color is generally a deep black, with a slight clouding on the sides, and a patch of tawny over each eye. The hanging lips of the Thibet dog give it a very curious aspect, which is heightened by the generally loose mode in which the skin seems to hang on the body.

The BULLDOG (Plate XVI) shares with the gamecock the reputation of being the most courageous animal in the world. His original vocation was bull-baiting, but at present he is kept either for fighting or breeding. Nearly all sporting dogs owe a good deal of their courage to some Bulldog ancestor. "Stonehenge" thinks the Bulldog is naturally sagacious and intelligent, and derives his evil habits from his human companions. He bites before he barks, and will attack anything; when he has once got hold he cannot be dislodged unless by choking. His repulsive appearance is chiefly due to his underhung jaw; in other respects he is a remarkably neat and compact animal.

THE NEWFOUNDLAND.

The NEWFOUNDLAND DOG (Plate XIV) is so called from its native country. It belongs to the group of Spaniels and is remarkably intelligent. It loves to be in water, and is famous for the numerous instances in which it has rescued drowning persons; it swims with great speed, owing to its large feet and legs. There are three kinds of this dog—the TRUE NEWFOUNDLAND, the LABRADOR DOG, and the ST. JOHN'S DOG.

The true Newfoundland is a magnificent and benevolent-looking animal, and an admirable companion; it stands twenty-five to thirty inches high, and has a long, shaggy coat; the favorite color is black, or black and white. Anecdotes of him are innumerable.

The story of the big dog that dropped the little dog into the water and then rescued it from drowning, is well known. But another dog behaved in a less generous manner. • Being provoked beyond all endurance by the continued annoyance of a small dog, it took the little tormentor in its mouth, swam well out to sea, dropped it in the water, and swam back again. Another of these animals, belonging to a workman, was attacked by a small and pugnacious bulldog, which sprang upon the unoffending canine giant, and, after the manner of bulldogs, "pinned" him by the nose, and there hung, in spite of all endeavors to shake it off. However, the big dog happened to be a clever one, and spying a pailful of boiling tar, he bolted toward it, and deliberately lowered his foe into the hot and viscous material. The bulldog had not calculated on such a reception, and made its escape as fast as it could run, bearing with it a scalding memento of the occasion.

The attachment which these magnificent dogs feel toward mankind is almost unaccountable, for they have been often known to undergo the greatest hardships in order to bring succor to a person whom they had never seen before. A Newfoundland dog has been known to discover a poor man perishing in the snow from cold and inanition, to dash off, procure assistance, telling by certain doggish language of its own of the need for help, and then to gallop back again to the sufferer, lying upon him as if to afford vital heat from his own body, and there to wait until the desired assistance arrived.

One day a Newfoundland dog and a mastiff had a sharp quarrel over a bone. They were fighting on a bridge, and over they went into the water. The banks were so high that they were forced to swim some distance before they came to a landing-place. It was very easy for the Newfoundland; he was as much at home in the water as a seal. But not so poor Bruce the mastiff; he struggled and tried his best to swim, but made little headway. The Newfoundland dog quickly reached the land, and then turned to look at his old enemy. He saw plainly that his strength was fast failing, and that he was likely to drown. So what did the noble fellow do but plunge in, seize him gently by the collar, and keeping his nose above water, tow him safely into port! It was funny to

see these dogs look at each other as they shook their coats. Their glance said as plainly as words, "We'll never quarrel any more."

Another incident exhibits the intelligence of the Newfoundland. A large, heavy wagon, which was, notwithstanding its enormous weight, dragged along at a smart trot by a vigorous horse, was passing lately through the Rue de la Chapelle, at Paris. An infant of three years of age having ventured on the public road, unconscious of the danger it was running, was just about to be crushed beneath the wheels of the huge vehicle. Quicker than thought, a magnificent Newfoundland dog, which was sitting on the pavement, darted forth with one immense bound, snapped up the little being, passed like an arrow beneath the wagon between the four wheels, and deposited the poor child safe and sound upon the opposite pavement.

The second variety is the LARGE LABRADOR DOG, which is never entirely black, and has a longer and more curly coat than the true Newfoundland. The third breed is the ST. JOHN'S DOG, which seldom exceeds twenty-five inches.

It is a popular mistake to suppose that, to secure a good specimen of these noble animals, it is necessary to send to the country from which they are named. In point of fact, the pure breed is almost extinct in Newfoundland, and there are to be found there now in their stead a race of mean-looking, shabby, cowardly, thievish mongrels, the degenerate descendants of a once noble race, and as different from them as the modern Greeks from the heroic Greeks of Homer. Neglect, ill-usage, starvation, and hard work have wrought the change. Rather more than two years ago an effort was made to introduce another breed, the celebrated Leonberg dog, the finest in the world—a development of, and a decided improvement on, the original Newfoundliand. The breeder of this race is Count Esseg of Leonberg, Wurtemberg, and hitherte his endeavors have been crowned with success.

THE TERRIER.

The TERRIER, so named from the Latin *terra* "the earth," was originally used to drive foxes or vermin from drains or burrows in the ground. He is a small, strong, and courageous dog, with a very good scent. As a rule, all terriers have a strain of bulldog in them, to which they owe their determination and endurance. In England, before the present style

of fox-hunting arose, Terriers were attached to every pack of fox-hounds; but the old fox-terrier has now become the assistant of the rat-catcher and game-keeper, or the faithful house-dog.

The BLACK-AND-TAN TERRIER (Plate XVI) is the old English Terrier. It is a smooth-haired dog, with a long, tapering nose, high forehead, and overhung jaw; the tail ought to be fine and rather drooping. The colors ought to be well contrasted without any speck of white. The mouth is always black. It is a lively, affectionate dog, a good ratter, but unequal to attack larger vermin.

The SCOTCH TERRIER resembles the English dog except in his coat, which is rougher and more mixed with gray. A cross between this dog and the otter-hound has produced the DANDIE DINMONTS, of which there are two varieties—the “Mustard,” of a reddish-brown color, and the “Pepper,” of a gray or blue-gray color. The legs are short, the body long, the ears large, the tail erect with a curve over the back, and the hair on the forehead is silky.

The SKYE TERRIER (Plate XVI) has a long body and short legs, and ought to measure from nose to tail three times its height. The tail is long and straight; the fore-legs are slightly bandy, and dew-claws are entirely absent. The hair is long, straight, and parted along the back; it hangs straight down nearly to the ground, and falls well over the eyes. The Skye is a good dog for vermin, but is now chiefly prized as a companion.

There are two kinds of pure Skyes—one small with soft hair, another larger with wiry hair. The Toy Skyes, with a black, silky coat, are produced by crossing with the Spaniel.

The YORKSHIRE TERRIER is a cross between a mongrel Skye and a Black-and-Tan Terrier. The coat is very long and silky, and abundant over the whole body, head, legs, and tail; its color is a silvery blue, the ears and legs are of a dark tan shade, and the long beard is of a golden tan, the top of the head almost fawn-colored. This dog is a modern invention and is only fit for a toy.

The BULL-TERRIER is a cross between the bulldog and the terrier; generally, however, the terrier cross is continued till the bulldog head disappears; the dog retains the courage of its ancestor and acquires more docility, and is the best of ratters; the first generation is an admirable fighting dog and will face anything. Mr. Andersson relates that, during his travels in Africa, his bull-terrier caught a rhinoceros by

the lower lip, and did not relinquish its hold till the beast was shot. The same dog attacked and killed jackals. A bull-terrier, which was celebrated in the sporting world under the title of "Tiny," weighed only five pounds and a half, and yet was known to destroy fifty rats in twenty-eight minutes and five seconds. It is estimated that this dog must have killed more than five thousand rats, the aggregate weight of which nearly equals a ton and a half. He could not be daunted by size or numbers, and was repeatedly matched against the largest rats that could be procured.

The FOX TERRIER is well represented at most dog-shows. The head is flat, jaw powerful, eyes small, ears set rather back, neck light, chest full, thighs well bent, legs strong. The color is white, with black or black-and-tan markings; coat fine, but hard. At present they are the favorite dog in England, and about the most numerous. These dogs are gay and lively in appearance. The best are white, and weigh about sixteen pounds.

THE COACH DOGS.

The GREAT DANISH DOG (Plate XIV) is a large, noble animal, with slender limbs and a smooth tail, short ears and large eyes, and is a cross between the mastiff and greyhound. His color is white, with brown, mouse-colored, or black patches. He used to be employed to hunt red deer; at present the name Danish Dog is given to a variety which is usually seen running with carriages.

The COACH DOG or DALMATIAN DOG (Plate XVI) is a handsome variety of pointer; his color is white, thickly spotted with black spots of a uniform size, about an inch in diameter. In England he runs with his master's carriage, his proper place being just in front of the horses. In his native country he works as a pointer.

TOY DOGS.

The PUG DOG (Plate XVI) is low and thick-set, of a fawn-color, with a black mask extending to the eyes and clearly defined. The coat is short, thick and silky, the head round, the nose short, tail short and curling closely to the side.

The POODLE is a very obedient, intelligent dog, and soon learns all kinds of tricks. He is a favorite in France and Germany, where he is

generally seen shaven, all but a ruff round the neck and legs and a tuft at the end of the tail. He is good-natured, playful and sociable, and makes a good watch-dog. He fetches and carries readily, and swims well; but, although possessed of keen scent, he has no sporting tastes.

The KING CHARLES SPANIEL (Plate XV) is a very small animal, as a really fine specimen ought not to exceed six or seven pounds in weight. Some of the most valuable King Charles Spaniels weigh as little as five pounds, or even less. These little creatures have been trained to search for and put up game after the manner of the springers and cockers; but they cannot endure severe exercise or long continued exertion, and ought only to be employed on very limited territory.

When rightly managed the King Charles is a most amusing companion, and picks up accomplishments with great readiness. It can be trained to perform many pretty tricks, and sometimes is so appreciative of its human playfellows that it will join their games.

The BLENHEIM SPANIEL is even smaller than the King Charles, and resembles it closely in its general characteristics. Both these animals have very short muzzles, long silky hair without any curl, extremely long and silky ears, falling close to the head and sweeping the ground. The legs are covered with long silky hair to the very toes, and the tail is well "feathered." The eyes of these little dogs are extremely moist, having always a slight lachrymal rivulet trickling from the corner of each eye.

A very celebrated but extremely rare "toy" dog is the MALTESE DOG, the prettiest and most lovable of all the little pet dogs.

The hair of this tiny creature is very long, extremely silky, and almost unique in its glossy sheen, so beautifully fine as to resemble spun glass. In proportion to the size of the animal, the fur is so long that, when it is in rapid movement, the real shape is altogether lost in the streaming mass of flossy hair. One of these animals, which barely exceeds three pounds in weight, measures no less than fifteen inches in length of hair across the shoulders. The tail of the Maltese dog curls strongly over the back, and adds its wealth of silken fur to the already superfluous torrent of glistening tresses. It is a lively and very good-tempered little creature, endearing itself by sundry curious little ways to those with whom it is brought in contact.

The Indians possessed two kinds of dogs before the Spanish discovery, both called by the generic name *Alco*. Buffon gives as the native names of the two species, *Ytzcuinte potzotli*, a short-necked, silky-haired dog;

and *Techichi*, a melancholy dog; the former is the Peruvian or Mexican lapdog, the latter the forest dog of Guiana. The best known variety is the much-prized MEXICAN MORSEY, which has fine woolly—not silky—hair. This is the tiniest of the dog family, and is precisely like the woollen dogs of the toy-shops.

The CHINESE DOG is remarkable only for the entire absence of hair on all parts of its body. In form it seems a modification of the greyhound, the body being long and narrow, the neck moderately long but thin, the head and muzzle pretty long, the legs thin without dew-claws on the hinder pair.

It is called Chinese because it does not come from China, but is probably a native of Africa, where it is said to be used to hunt the antelope. It is very light, swift, and persevering, and is reported to be indefatigable in tracking its game. These exploits of the hairless dog, however, require confirmation, and dates and places. With us the unfortunate creature is a mere monster, kept as a curiosity to gratify a perverted taste, and it must suffer severely from the changes of our climate. One possessed by the writer was good-natured and playful, and was a good watch-dog, but was excessively afraid of other dogs.

THE DINGO.

The DINGO, *Canis dingo* (Plate XIV), is not a noble savage who has never known civilization, but a civilized dog run wild. It is the only carnivorous animal found in Australia, consequently is not a marsupial, and therefore is not indigenous to the island. It has all the look of a domestic dog. It is about as large as a sheep-dog, and is of a reddish-brown color, sprinkled with black. It crosses freely with the tame dog.

Large packs of these wild dogs ravage the localities in which they have taken up their residence, and have attained to so high a degree of organization that each pack will only hunt over its own district, and will neither intrude upon the territory which has been allotted to a neighboring pack of Dingoes, nor permit any intrusion upon its own soil. For this reason their raids upon the flocks and herds are so dangerous that the colonists have been obliged to call meetings in order to arrange proceedings against the common foe. Before the sheep-owners had learned to take effectual measures to check the inroads of these marauders, they lost their flocks in such numbers that they counted their missing sheep

by the hundred. From one colony no less than twelve hundred sheep and lambs were stolen in three months.

The Dingo is cowardly, and will rather run away than fight; but when hard pressed, and it finds that its legs are of no use, it turns to bay with savage ferocity, and dashes at its opponents with the furious energy of despair. It carries these uncivilized customs into domesticated life; and even when its restless limbs are subjected to the torpifying thralldom of chain and collar, and its wild, wolfish nature allayed by regular meals and restricted exercise, it is ever ready to make a sudden and unprovoked attack upon man or beast, provided always that its treacherous onset can be made unseen. After the attack it always retreats into the farthest recesses of its habitation, and there crouches in fear and silence, whether it has failed or succeeded in its cowardly malice.

Thus we see that if the dog is necessary for man, man is no less necessary for the dog. Without human society, human guidance, and human rule, the dog, in a few generations, displays all the vices of his wolfish progenitors.



CHAPTER XIV.

THE WEASELS, OTTERS AND SKUNKS.

THE MARTENS—THE SABLE—THE AMERICAN SABLE—THE BLACK CAT—THE POLECAT—THE ERMINE—THE NEW YORK ERMINE—THE FERRETS—THE MINK—THE WEASELS—THE WOLVERINE—THE OTTERS—THE CANADA OTTER—THE CALIFORNIA OTTER—THE SEA OTTER—THE BRAZILIAN OTTER—THE CHINESE OTTER—THE BADGERS—THE AMERICAN BADGER—THE TELEU—THE RATEL—THE SKUNKS—THE ZORILLA—THE SURILHO—THE COMMON SKUNK—THE NYENIEK.

THE family of the MUSTELIDÆ may be divided conveniently into three sub-families, the MUSTELINÆ, containing the Weasels and Gluttons, the LUTRINÆ, containing the Otters, and the MELININÆ, containing the Badgers and Skunks. The family comprises *twenty-eight* genera and *ninety-two* species, of which we shall mention the most interesting.

THE MARTENS.

The highest position in this sub-family is held by the Martens, slender, short-legged animals with a pointed head, round ears, and moderate size. By many writers the genera *Martes* and *Mustela* are united into one.

GENUS MARTES.

This genus, comprising the Martens proper, is distinguished by possessing thirty-eight teeth. The two species found in the United States are placed by Baird in the Mustelæ.

The PINE MARTEN, *Martes abietum* (Plate XIX), is a very pretty active creature, with a body measuring eighteen inches to two feet, and a tail about one foot in length. In Europe it is found in Scandinavia, Russia, England, Germany, France, Italy, and Spain; and in Asia, as far as the Altai Mountains. The largest specimens dwell in Sweden, and

their fur is of extraordinary thickness. The color does not vary essentially, being generally brown, with a yellowish tinge in Spain and Italy, and a gray hue in Sweden.

The Pine Marten is so called because it is generally found in those localities where the pine-trees abound. It is a shy and wary animal, and although fierce when brought to bay, naturally shuns collision with an enemy. It traverses the trunks and branches with wonderful address and activity, being enabled by its rapid and silent movements to steal unnoticed on many an unfortunate bird, and to seize it in its deadly gripe before the victim can take flight. It is very fond of appropriating to its own use the nests of crows and other birds, and sometimes occupies the habitation of a squirrel which it has previously killed. Its fur is valuable, and little inferior to that of the Sable.

The BEECH MARTEN, *Martes foina*, is distinguished by the white tint of the fur on the throat and breast, and by its habit of prowling about human habitations. It is more easily domesticated than the Pine Marten, which in other respects it closely resembles.

The odor secreted by the inguinal glands of these two species is of a musky, not offensive, odor, and hence they are called in England Sweet-martens, to distinguish them from the Foul-martens or Polecats.

The SABLE, *Martes zibellina* (Plate XIX), has large ears, long legs, and a brilliant, silky fur, and is found from the Ural Mountains to Behring Straits. It lives near the banks of rivers in burrows among the roots of trees, or in hollow trees; its food in summer consists of hares and small animals, in winter it is said to feed on wild berries.

The value of its fur has induced a constant pursuit of the Sable, and as it is most valuable when the animal is captured in winter, the hardships to be undergone by the hunter are very great. The Sables are taken in various modes. Sometimes they are captured in traps, which are formed in order to secure the animal without damaging its fur. Sometimes they are fairly hunted down by means of the tracks which their little feet leave in the white snow, and are traced to their domicile. A net is then placed over the orifice, and by means of a certain pungent smoke which is thrown into the cavity, the inhabitant is forced to rush into the open air, and is entangled in the net. The hunters are forced to support themselves on the soft yielding surface of the snow by wearing "snow-shoes," or they would be lost in the deep drifts which are perfectly capable of supporting so light and active an animal as that they



FERRET

ERMIINE

WEASEL

SABLE

PINE MARTIN

RATEL

POLE CAT

SKUNK

PLATE XIX CARNIVORA

are following. The Sable measures about eighteen inches in length, and an ordinary skin is worth thirty to thirty-five dollars; one of the very best quality, however, will bring sixty to seventy-five dollars.

The AMERICAN SABLE, *Martes Americana*, varies a good deal in color, but is usually of a dull grayish-brown, which becomes darker in winter. It is shy, cruel, cunning and active, but does not approach the habitations of man. It is found in the wooded districts of the northern parts of America, from the Atlantic to the Pacific, from the 68th to the 40th degree of latitude. It is considered by Audubon identical with the European Pine Marten.

The BLACK CAT or FISHER, *Martes Pennantii*, has long canine teeth, and indeed its head resembles that of a dog more than that of a cat; the fur is chestnut-brown, with whitish hairs interspersed, which mixture of tints produces a hoary appearance. It is rare in the Northern and Eastern States, but is still met in the thinly settled portions. It obtains its name of "Fisher" from its singular fondness for the fish used to bait traps; it is a formidable enemy to the raccoon and the squirrel, and often pursues the American Sable. When attacked by dogs it makes a more desperate resistance than either the gray or the red fox. It is the largest of the Martens.

The WOODCHUCK, *Martes Canadensis*, is of some value on account of its fur, which is of a grayish-brown color. It lives in burrows on the banks of streams, its food consisting of fish and animals which live near water.

GENUS PUTORIUS.

This genus comprises the Fomarts or Polecats, and they differ from the Martens not only by giving out an offensive odor, but by possessing only thirty-four teeth.

The POLECAT, *Putorius fætidus* (Plate XIX), is bold and blood-thirsty, destroying remorselessly everything it can; it sucks the blood of its victims and eats their brains, leaving the body untouched. Its fur is often fraudulently sold for sable, but is most valued for the manufacture of artists' brushes which are made from the long, sharp, brown hairs which protrude through the creature's woolly coat.

It is a determined foe to game, ravages poultry-yards, and attacks even frogs, newts, and fish; large stores of eels have been found in the

larder of the Polecat, and the nests of the wild bees are not safe from the intrusions of this daring plunderer.

The FERRET, *Putorius furo* (Plate XIX), is an African polecat, and requires, in England, where it is used in rabbit-hunting, to be preserved carefully from cold or frost. One variety is of a creamy white color, with bright pink eyes, another, produced by crossing with the Polecat, is darker and fiercer.

When used for hunting rabbits, it is usually muzzled before it is sent into the burrow, for if its teeth were at liberty, it would kill the first rabbit it met, and remain sucking its blood. It is a very fierce animal, and apt to turn on its owner. A tame one has been known to attack a child in the cradle, mangling it terribly.

The ERMINE or STOAT, *Putorius ermineus* (Plate XIX), is larger than the Weasel. It is a determined hunter, and tolerably swift, possessing good powers of scent, and singular endurance. It has, however, obtained its fame from the beauty of its fur. In summer its coat is of a reddish-brown, not quite so ruddy as that of the weasel, but in winter it becomes entirely white, with the exception of the tail, two-thirds of which remain black. Two explanations of this change of color have been given. One is that new and white hairs are produced in autumn to supply the place of the falling brown ones. The other, which is now generally accepted, is that the summer hairs become blanched.

The hairs are not entirely white, even in their most completely blanched state, but partake of a very delicate cream-yellow, especially upon the under portions, while the slightly bushy tip of the tail remains in its original black tinting, and presents a singular contrast to the remainder of the fur. In temperate latitudes, the Stoat is never sufficiently blanched to render its fur of any commercial value, and the hair appears to be longer, thicker, and whiter in proportion to the degree of latitude in which the animal has been taken. As may be supposed, from the extreme delicacy of the skin in its wintry whiteness, the capture of the Stoat for the purpose of obtaining its fur is a matter of no small difficulty. The traps which are used for the purpose of destroying the Stoat are formed so as to kill the animal by a sudden blow, without wounding the skin; and many of the beautiful little creatures are taken in ordinary snares.

The Ermine is extensively diffused over the northern regions of the Old World; the colder the climate is, the more valuable the fur becomes,

and hence the most valuable specimens come from Siberia, whence about 400,000 pelts are annually sent to market.

The NEW YORK ERMINE, *Putorius Noveboracensis*, is called also the White, and the Common Weasel. It is found as far south as Pennsylvania. It differs from the European Ermine, the tail not being so long, but the hair very long and bushy. It does not change the color of its coat in winter.

KANE'S ERMINE, *Putorius Kancii*, was so named by Baird in honor of the Arctic explorer, Dr. Kane. Its length to the tail is about eight inches, the tail vertebræ about one-sixth of this length. In summer it is brown, in winter, white. It is smaller than the European Ermine, but has a longer tail, and the black color in place of occupying two-thirds, takes up only one-half of that appendage.

The LITTLE NIMBLE WEASEL, *Putorius agilis*, is light, slender, and graceful; it is smaller than the Ermine, but stands higher in proportion, and has more prominent ears. In summer the color of the fur on the upper portion is light-brown, on the belly and throat white; in winter, the whole body is pure white, except an inch and three-quarters of black at the tip of the tail. The specimen described by Audubon was obtained in the northern part of New York; its burrow was situated on a high ridge of pine-land, and had a very narrow entrance. It feeds upon the meadow mouse, the little chipping squirrel, and other small animals.

The TAWNY WEASEL, *Putorius fuscus*, is more robust than the European Weasel, and is of a uniform tawny brown color. It does not change color in winter. It is found in the States of New York, Ohio, and Michigan.

The MINK, *Putorius vison*, is of a brown color, with some white about the jaws; but both the color and the size vary considerably. It lives by the banks of ponds or marshes, and its food is chiefly aquatic. In shape it assumes something of the Otter aspect. Its fur is excellent in quality, and as it bears a great resemblance to the sable, it is often substituted for that article.

The SMALL WEASEL, *Putorius pusillus*, is the smallest of our native species; it has a very short tail, without the black tip common to other species. It is very like the common weasel, but smaller.

The YELLOW-CHEEKED WEASEL, *Putorius xanthogenys*, is found only in California; it derives its specific name from three yellow patches on

the cheeks. The back and sides are brown, the abdomen slightly duller in tint.

THE SMALL BROWN WEASEL, *Putorius cicognanii*, is common in New England. It is brown above, and white beneath, the tail has a black tip, and is one-fifth the length of the body.

RICHARDSON'S WEASEL, *Putorius Richardsonii*, has smaller feet, higher ears, and a longer tail than the preceding species. Its summer coat is dark-brown; its winter raiment white. The hair on the tail does not form a brush.

THE BRIDLED WEASEL, *Putorius frenatus*, is found in Texas, and perhaps extends into Mexico. It has a yellowish patch on its forehead, and another just in front of each ear.

THE BLACK-FOOTED FERRET, *Putorius Nigripes*, is, according to Audubon, the size of the Marten; the tail is one-third of the length of the body; the feet, tip of tail, and forehead are black.

GENUS MUSTELA.

THE WEASEL, *Mustela vulgaris* (Plate XIX), does not exceed ten inches in length over all; the color is a reddish-brown on the upper part of the body, but the under portions are pure white. It is one of the most audacious of animals, and will attack anything, however superior in size; it is a terrible foe to rats and mice, and in this respect makes some atonement for the chickens it occasionally kills. It hunts by scent and will even cross water in the chase. When it reaches its prey, it fixes its teeth in the back of the neck and drives them into the brain.

Weasels will unite their forces, and act in concert to repel a foe. It is reported that a powerful man was so worn out with his exertions in keeping off his assailants, that he would soon have sunk under their united attacks had he not been rescued by the timely assistance of a horseman who happened to pass near the spot, and who came to the rescue with his whip. Urged by their bloodthirsty instinct, the Weasels all directed their efforts to the throat, and made their attacks in such rapid succession that their opponent was solely occupied in tearing away the active little creatures and flinging them on the ground, without being permitted the necessary leisure for killing or maiming his pertinacious and undaunted antagonists.

GENUS GULO.

This genus is represented by *one* species, which keeps to the cold regions of Europe and Asia, and on this continent comes as far south as the Great Lakes.

The WOLVERENE, *Gulo luscus* (Plate XX), has a strong compact body, a short tail, which is very bushy, a thick short neck, large head and short legs. Sometimes it attains the length of three feet. Old naturalists gave this animal the name of GLUTTON, and told marvellous stories respecting its voracity; in fact it has been known in captivity to eat thirteen pounds of meat in a day.

The general aspect of this animal is not unlike that of a young bear, and probably on that account it was placed by Linnæus among the bears under the title of *Ursus Luscus*. The general color of the Wolverine is a brownish-black; the muzzle is black as far as the eyebrows, the space between the eyes of a brownish hue. In some specimens, a few white spots are scattered upon the under jaw. The sides of the body are washed with a tint of a warmer color. The paws are quite black, and the contrast between the jetty fur of the feet and the almost ivory whiteness of the claws is extremely curious. These white claws are much esteemed among the natives of Siberia for use in manufacturing certain feminine adornments.

The Wolverine is specially obnoxious to hunters, as it takes the bait from their traps, and discovers the stores of provisions that they have *cached* or hidden as they advanced, and on which they depend for sustenance on their return.

GENUS GALICTIS.

The *two* species of this genus are confined to tropical America, and differ very little in their habits or modes of life.

The GRISON or HURON, *Galictis vittata*, is found in Brazil and Paraguay. Its color is peculiar, being lighter on the back than on the belly the latter being of a dullish black color, the former covered with a gray fur. The ears of this species are very small, and the tongue is rough. The hairs which give the distinctive coloring to the upper parts of the Grison are longer than those which cover the remaining portions of the

body and the limbs. In total length it measures about two feet, the tail being rather more than six inches in length; the neck is very long and snake-like. All its movements are brisk and cheerful.

The odor which proceeds from the scent-glands of the Grison is peculiarly disgusting, and offends human nostrils even more than that of the stoat and polecat.

The TAYRA, *Galictis barbara*, is of a uniform black color, with the exception of a large white patch on the throat and chest. It is often called the Great Weasel, and is nearly the size of the Common Marten.

THE OTTERS.

The next sub-family, the *Lutrinæ*, is divided by some authorities into *ten* genera, by others only into *three*. All are characterized by a long body, small prominent eyes, short round ears, and webbed feet, and all inhabit rivers and lakes, or seas. They are all excellent swimmers, and can remain a long time under water.

GENUS LUTRA.

The COMMON OTTER, *Lutra vulgaris*, is found in all parts of Europe and Northern Asia. In India and China it is represented by allied genera.

This aquatic weasel is a terrible foe to fish, being quite as destructive in the water as any polecat or stoat is on the land.

For the pursuit of its finny prey the Otter is admirably adapted by nature. The body is lithe and serpentine; the feet are furnished with a broad web that connects the toes and is of infinite service in propelling the animal through the water; the tail is long, broad, and flat, proving a powerful and effectual rudder by which its movements are directed; and the short, powerful legs are so loosely jointed that the animal can turn them in almost any direction. The hair which covers the body and limbs is of two kinds, the one a close, fine, and soft fur, which lies next the skin and serves to protect the animal from the extremes of heat and cold, and the other composed of long, shining, and coarser hairs, which permit the animal to glide easily through the water. The teeth are sharp and strong, and are admirably adapted for preventing the slippery prey from escaping.

The color of the Otter varies slightly according to the light in which

it is viewed, but is generally of a rich brown tint, intermixed with whitish-gray. This color is lighter along the back and the outside of the legs than on the other parts of the body, which are of a paler grayish hue. Its habitation is made in the bank of the river which it frequents, and is rather inartificial in its character, as the creature is fonder of occupying some natural crevice or deserted excavation than of digging a burrow for itself. The nest of the Otter is composed of dry rushes, flags, or other aquatic plants, and is purposely placed as near the water as possible, without danger of being inundated.

The Otter can be easily trained to hunt for its master. In the East Indies tame otters are nearly as common as tame dogs with us; and in Germany and England many tame otters have been described.

The mode of instruction which is followed in the education of the Otter is sufficiently simple. The creature is by degrees weaned from its usual fish diet, and taught to live almost wholly on bread and milk; the only fish-like article which it is permitted to see being a leathern caricature of the finny race, with which the young Otter is habituated to play, as a kitten plays with a crumpled paper or a cork, which does temporary duty for a mouse. When the animal has accustomed itself to chase and catch the artificial fish, and to give it into the hand of its master, the teacher extends his instructions by drawing the leathern image smartly into the water by means of a string, and encouraging his pupil to plunge into the stream after the lure and bring it ashore. As soon as the young Otter yields the leathern prey, it is rewarded by some dainty morsel which its teacher is careful to keep at hand, and soon learns to connect the two circumstances together.

The NORTH AMERICAN OTTER, *Lutra Canadensis* (Plate XX), differs from the European Otter by the large size of the naked muzzle and by the skull. It is now exceedingly scarce, and is hunted for its highly prized fur. There are two kinds of this fur, an under coat, very fine and soft, and an outer one, long, coarse, and shining. Audubon tamed several Otters that had the run of his library, and used to climb into his lap.

It is very shy, building its dwelling close to the banks of a running stream. It has a most remarkable habit of "coasting." In winter it selects a high bank of snow, and slides down it head-foremost; in summer it indulges in the same game on a steep river bank ending in deep water. Audubon saw two Otters make twenty-two descents in succession on one of these slides without intermission.

The CALIFORNIA OTTER, *Lutra Californica*, differs from the Canadian, by possessing a shorter muzzle. It is about four and a half feet long; the color above is liver-brown, the under surface of the throat a dirty-white. The ears are small, pointed and high, and the hind feet rather larger than the fore feet. Its habits are the same as those of other otters.

GENUS ENHYDRIS.

The SEA OTTER, or KALAN, *Enhydris marina* (Plate XX), the *only* species of the genus, prefers sea-water to fresh for the greater part of the year. It is very much larger than its fresh-water relations, being rather more than twice the size of the common Otter, and weighing as much as seventy or eighty pounds. During the colder months of the year, the Kalan dwells by the sea-shores, and is found upon the coasts of the Northern Pacific, where it is active in the capture of marine fish. When the warmer months begin, the Sea Otter leaves the coasts, and in company with its mate proceeds up the rivers until it reaches the fresh-water lakes. There it remains until the lessening warmth gives warning for it to make its retreat seawards before the frosts seal up the waters.

It is a scarce animal, and is not prolific. The fur of the Kalan is extremely beautiful, shining with a glossy velvet-like sheen, and very warm in character. It is, in consequence, valued at a very high price. The color of the fur is rather variable, but its general hue is a rich black, slightly tinged with brown on the upper portions of the body, while the under portions of the body and the limbs are of a lighter hue. In some specimens the head is nearly white, and in one or two instances the white tinge extends as far as the neck. Indeed, the proportions of dark and white fur differ in almost every individual.

All the Otters are long-bodied and short-limbed, but in the Kalan this peculiarity is very conspicuous on account of the comparative shortness of the tail, which is barely seven inches in length while the body measures three feet on the average.

GENUS LONTRA.

This genus contains *three* species, of which we mention the most characteristic.



BADGER
OTTER

WOLVERINE
SEA OTTER

PLATE XX CARNIVORA

The ARRIANHA, *Lontra Brasiliensis*, differs from the Common Otter very slightly, but is considerably larger; the head is rounder and the tail is sharply flattened vertically. It fishes in bands of considerable numbers. Although it prefers a fish diet, yet it has been known to kill geese when swimming in a pond. It betrays a determined hostility to dogs, and attacks any that straggle from the hunter's camp.

According to Azara, "this species lives in troops, which rising to the surface of the water, bark like dogs. Each family possesses a separate domain, and spends as much time on the water as it does on land. Its motions are slow, and it drags its belly along the ground." It is found in the Amazon and other rivers of Brazil.

GENUS AONYX.

The *five* species of the genus are from Africa and Eastern Asia.

The CHINESE or JAVANESE OTTER, *Aonyx leptonyx*, is somewhat small, measuring only about three feet. Its color is tawny rather than brown, and the whiskers are strongly developed. When wild it is very ferocious, but when taken young is gentle and tractable, and in China and Java is kept in many houses. Its voice is said to resemble that of a person crying in pain or grief.

THE BADGERS.

Our third sub-family, the *Meliniæ*, comprises the Badgers, Ratels, and the unsavory and dreaded Skunks.

GENUS ARCTONYX.

The SAND BEAR, *Arctonyx collaris*, the *only* species, has longer legs, and a more hog-like snout than the common Badger. Its color is of a yellowish-white, marked with two black bands that run on each side of the head, uniting at the muzzle; the toes are united for their entire length, and are armed with powerful claws. It is a fierce animal, and when attacked stands up like a bear, and fights with its fore limbs. It is found in the East Indies, and is sometimes called the Indian Badger. The native name is Balisaur, or "Sand Hog."

GENUS MELES.

The *four* species of this genus are found from the Atlantic Ocean to Japan, and as far south as Hong Kong in China.

The BADGER, *Meles taxus* (Plate XX), is a quiet inoffensive creature, slow and clumsy in its movements, and awkward in its gait. Its colors are gray, black and white; the head is white with a broad black line on each side, the body is gray, the chest and abdomen, legs and feet are of a deep blackish-brown. Its average length is two feet six.

It lives in a long and tortuous burrow, which it digs with great rapidity, using its nose to push aside the earth, which is then flung backward by its paws. It has long and sharp teeth, and a peculiar arrangement of the jaws by which they lock and remain closed without farther effort; its bite is therefore very severe. The word "Badger" is old English for a corn-dealer, and the animal has got this title because it is accused by ignorant persons of injuring the crops of wheat and oats; but far from causing injury, it is benefiting the farmer by its pursuit of mice and the larvæ of insects. It is said to be bolder and fiercer in the steppes of Asia, where it ventures to attack calves and sheep. At the end of autumn the Badger retires to his burrow, makes a thick, warm bed, and rolls himself up for his winter sleep. This is not continuous; he awakens at any spell of fine weather, and leaves his den to get a drink. In Germany the Dachshund is used to drive him from his hole, in which operation the dog often suffers severely, owing to the fierce bite of the inhabitant. A Badger will receive without injury the most violent blows on the body, but one stroke on the nose kills him.

GENUS TAXIDEA.

The *two* species of this genus are both North American. They have short, low bodies, short tails, large claws, and pointed skulls.

The MEXICAN BADGER, *Taxidea Berlandieri*, differs slightly from the following species, the most noticeable variation being in the continuation of the white line on the head to the root of the tail.

The AMERICAN BADGER, *Taxidea Labradoria*, has one tooth less on each side in the lower jaw than the European Badger. The body is

thick, heavy, flat and broad, and is covered in winter with a dense fur three inches long, of a hoary-gray appearance; in summer the hairs become shorter and approach to yellowish-brown; the coat in summer may be best described as hairy, but in winter, as woolly.

This Badger may be distinguished from that of Europe by its hairy muzzle, stout fore-limbs, strong claws, and conical head. It attains a length of about two feet and a half.

GENUS MYDAUS.

This Asiatic genus is represented by *one* species, which is nearly as offensive as our native Skunk.

The TELEDU, *Mydaus meliceps*, is a native of Java, and is confined to the mountainous districts where the earth is light, and hunting for underground insects proportionately easy. Horsfield writes:

“The *Mydaus* forms its dwelling at a slight depth beneath the surface, in the black mould, with considerable ingenuity. Having selected a spot defended above by the roots of a large tree, it constructs a cell or chamber of a globular form, having a diameter of several feet, the sides of which it makes perfectly smooth and regular; this it provides with a subterraneous conduit or avenue, about six feet in length, the external entrance to which it conceals with twigs and dry leaves. During the day it remains concealed, like a badger in its hole; at night it proceeds in search of its food, which consists of insects and other larvæ, and of worms of every kind. It is particularly fond of the common lumbrici, or earthworms, which abound in the fertile mould. These animals, agreeably to the information of the natives, live in pairs, and the female produces two or three young at a birth.

“The motions of the *Mydaus* are slow, and it is easily taken by the natives, who by no means fear it. During my abode on the Mountain Prahu, I engaged them to procure me individuals for preparation; and as they received a desirable reward, they brought them to me daily in greater numbers than I could employ. Whenever the natives surprise them suddenly, they prepare them for food; the flesh is then scarcely impregnated with the offensive odor, and is described as very delicious. The animals are generally in excellent condition, as their food is found in abundance in the fertile mould of the country.

Like the skunk, it can eject a most offensive fluid. "On the Mountain Prahú, the natives, who were most active in supplying me with specimens of the *Mydaus*, assured me that it could only propel it to the distance of about two feet. The fetid matter itself is of a viscid nature: its effects depend on its great volatility, and they spread through a great extent. The entire neighborhood is infected by the odor of an irritated Teledu, and in the immediate vicinity of the discharge it will produce syncope.

"The color of the Teledu is a blackish-brown, with the exception of the fur upon the top of the head, a stripe along the back, and the tip of the short tail, which is a yellowish-white. The under surface of the body is of a lighter hue. The fur is long and of a silken texture at the base, and closely set together, so as to afford to the animal the warm covering which is needed in the elevated spots where it dwells. The hair is especially long on the sides of the neck, and curls slightly upwards and backwards, and on the top of the head there is a small transverse crest. The feet are large, and the claws of the fore limbs are nearly twice as long as those of the hinder paws. In the whole aspect of the Teledu there is a great resemblance to the badger, and, indeed, the animal looks very like a miniature badger, of rather eccentric colors."

GENUS MELLIVORA.

The *three* species of this genus inhabit tropical and South Africa and India to the foot of the Himalayas. The animals contained in them have short noses, short tails, and broad backs, and only thirty-two teeth.

The RATEL, *Mellivora capensis* (Plate XIX), loves to feed on the combs and young of the honey-bee. As it is exposed to the attacks of these infuriated insects, it has received from nature a thick, coarse, and rough fur, which is impenetrable to their stings. It digs with great skill and sinks into the ground in a few minutes.

The color of the Ratel is black upon the muzzle, the limbs, and the whole of the under portions of the body; but upon the upper part of the head, neck, back, ribs, and tail, the animal is furnished with a thick covering of long hairs, which are of an ashy-gray color. A bright gray stripe, about an inch in width, runs along each side, and serves as a line of demarcation between the light and the dark portions of the fur. The

ears of the Ratel are extremely short. The lighter fur of the back is variously tinted in different individuals, some being of the whitish-gray which has been already mentioned, and others remarkable for a decided tinge of red. The length of the Cape Ratel is rather more than three feet, inclusive of the tail, which is about eight inches in length.

In captivity the Ratel is very lively and amusing. The writer has often watched one in the Zoological Gardens in London, and can confirm the account given by Wood in his Natural History.

"In the enclosure that has been allotted to this animal, the Ratel has, by dint of constantly running in the same direction, made for itself an oval path among the straw that is laid upon the ground. It proceeds over the course which it has worked out, in a quick active trot, and every time that it reaches either end of the course, it puts its head on the ground, turns a complete summersault, and resumes its course. At intervals, it walks into its bath, rolls about in the water for a second or two, and then addresses itself with renewed vigor to its curious antics."

GENUS ICTONYX.

The *two* species which have been formed into this genus are natives of Africa, and have a remarkable dentition, while in skeleton they seem to be midway between the Martens and the Skunks proper.

The ZORILLA, *Ictonyx capensis*, or *Zorilla striata*, is found throughout Africa, and even in Asia Minor. The Dutch of the Cape style it the *muishund* or "mousedog," an honorable title given it, because it destroys so many of those little rodents. It is somewhat inactive, and avoids water whenever it can, although it is an excellent swimmer when forced to take to the water.

The color of specimens of this animal vary considerably, but they all have the same marks. In some, a broad white transverse band crosses the back of the head, from it four longitudinal bands run down the back, separated by three black stripes; the two outer white stripes are prolonged on the tail. In others, the whole back is white, with the three black longitudinal stripes.

The Zorilla emits an obnoxious odor which it uses like the skunk, and drives dogs and hunters to ignominious flight. The very touch of a dead Zorilla leaves a permanent odor on whatever has been in contact with it.

GENUS MEPHITIS.

We cannot affirm that any member of the Mustelidæ is truly sweet-smelling; we have described the Fomart and Polecat, the Teledu and the Zorilla, but what are they beside our native Skunk? The animals forming the *twelve* species of this genus are exclusively American, and are found from Canada to the Straits of Magellan. They are distinguished from their nearest relations, the Badgers, by a slenderer body, a long bushy tail, a black ground color, with white marks. The head is small, the nose hairless and thick, the eyes small and sharp, the ears short and round, the legs are short, the feet large, with five toes provided with long weak claws. The number of teeth is thirty-two. Each of the mephitic glands contains a space the size of a nut, and is provided with a strong muscle. This space is filled with an oil-like fluid, which by contracting the muscle can be ejected in a narrow stream which is gradually resolved into spray. The odor is stronger when the animals are old, especially with the male sex.

The SURILHO, *Mephitis suffocans*, inhabits Brazil, and attains a length of sixteen inches in the body. The hair is thick, long, and abundant; it is short on the snout, but gradually grows longer till it attains a length of nearly three inches on the tail. Two white stripes run from a point on the forehead to the root of the tail, at times widening so that the space between them is reduced to a mere line; the tail has a white tip.

The Surilho lives in the plains, and avoids the thick primeval forest, haunting the clumps of trees that are found in the campos. Its presence can be discovered by a small funnel-shaped hole which it makes in the ground. It is a nocturnal animal, and lives on insects.

THE SKUNK.

The COMMON SKUNK, *Mephitis mephitis* (Plate XIX), has a broad fleshy body, with a small head and short legs. This species varies so much in color, that there is some difficulty in finding two specimens alike, but, speaking generally, we may say that there is a narrow white stripe commencing on the nose and running to a point on the top of the head; a patch of white, two inches in length, covers the upper part of

the neck; on each side of the vertebrae of the tail there is a white longitudinal stripe, and the tail is broadly tipped with white; on every other part of the body the color is blackish-brown.

The Skunk is neither shy nor timid, and walks slowly as if conscious that nothing dare molest it. When surprised, it quickly makes use of its natural weapon of defence, and generally to the discomfiture of its enemy.

"It happened in our early school-boy days," writes Audubon, "that we observed in our path a pretty little animal, playful as a kitten, throwing up its bushy tail, and seemingly desirous to keep company with us. It makes no effort to escape, we run towards it, it waits for us, and raises its tail as if inviting us to take hold of its brush. We seize it instantaneously, and grasp it with the energy of a miser clutching a box of diamonds, a short struggle ensues, when—faugh! we are suffocated, our eyes, nose, and face are suddenly bespattered with the most horribly fetid fluid!" The offensive odor often produces sickness and vomiting, and is of an acrid character. Dr. Richardson states that he knew several Indians who lost their eyesight in consequence of the inflammation produced by it. A dog, when he has received the discharge, seems half distracted, plunging his nose into the earth and rolling in every direction, and the eyes have been swollen and inflamed for a week afterward. The Skunk can eject this nauseous fluid with unerring aim to a distance of upwards of fourteen feet; it is a thin transparent fluid scarcely visible by day, but at night resembles an attenuated stream of phosphoric light. Everything on which it falls is tainted for a considerable time, if not forever; clothes that have once been infected will, after every effort has been made to purify them, give out the sickening effluvium if the wearer incautiously comes near the fire. It has been sometimes used as a medicine in cases of asthma, but the verdict of the patient generally is, that the remedy is worse than the disease.

The Skunk has a bad character among the farmers, and destroys large numbers of eggs, but he is too clumsy to do much damage.

The burrows of the Skunk are found on a flat surface, and seldom possess more than one entrance; the gallery runs about seven or eight feet in a straight line, about two feet beneath the surface, and ends in a large excavation containing an immense nest of leaves. During winter, five to fifteen individuals may be found in these burrows ready to defend themselves by the means with which Nature has provided them.

The Skunk in the Northern States retires to its burrow about December, and remains there till February; during this period of inaction he is dull and sluggish, but certainly not asleep. In the South he prowls actively about, "stealing, and giving odor."

When taken young, and the glands removed early, the Skunk is easily tamed, and becomes an interesting pet, keeping its fur exceedingly clean and smooth.

The LARGE-TAILED SKUNK, *Mephitis macroura* differs from the common Skunk in the length of its tail, and in its markings. It is the size of the common cat, of a brownish-black color, with a white stripe on each side of the back, and on the forehead; and the tail is longer than the body. This species is very common in Texas, where its tail is used by the country-folk as a plume or feather in their hats.

This species exists on the western ranges of the mountains in Mexico, in New Mexico, and the western parts of Texas.

The CALIFORNIA SKUNK, *Mephitis occidentalis*, has an oval spot of white on the forehead, and a large spot on each temple, with four interrupted white stripes on the sides and back, the tail being tipped with white.

The TEXAN SKUNK, *Mephitis mesoleuca*, is distinguished from the Common Skunk by having the nose naked for about three-fourths of an inch above the snout. The whole back from the forehead to the tail, and the tail, is white, the whole of the under surface of the body is black.

This species is not met in any portion of the United States north of Texas, but seems to represent in that State the common Skunk.

GENUS HELICTIS.

The *four* species of this genus are found in Eastern Asia, from Nepal to Java, Formosa and Shanghai.

The NYENTEK, *Helictis Nepaulensis*, has been described by Horsfield. The body is about sixteen inches in length, the tail about six; the color is a grayish-brown, with white markings, the ears are large, and the eyes prominent. Little is known of the habits of this creature, but Horsfield supposes they resemble those of the Ratel.

CHAPTER XV.

THE RACOONS AND PANDAS.

THE COMMON RACoon—THE CRAB-EATING RACoon—THE CALIFORNIA COON—THE COATI—THE RED COATI—THE WHITE COATI—THE KINKAJOU—THE AMERICAN CIVET OR MOUNTAIN CAT—THE PANDA OR WAH.

THE family PROCYONIDÆ are a small but interesting family of bear-like quadrupeds, ranging from British Columbia to Paraguay and the tropical forests to the south thereof. It embraces *four* genera, all peculiar to the New World.

I.—GENUS PROCYON.

This genus is usually considered to be represented by only *one* species, but at least the varieties inhabiting South America are so well defined as to deserve the dignity of species. The animals in this genus are characterized by the following marks. The body is compact, the head very broad posteriorly, the muzzle short, the eyes large and close together, the ears large and on the side of the head, the legs high and thin, the soles of the feet naked with moderately long toes and strong claws; the tail is long, the fur rich, long and smooth.

The RACoon, *Procyon lotor* (Plate XXI), derives its specific title of "*Lotor*" or "Washer" from its habit of immersing its food before eating: it grasps the morsel in both fore-paws, and shakes it violently backward and forward in the water.

The general tint of the body and limbs is an undecided blackish-gray, the gray or black predominating according to the position of the observer and the arrangement of the fur. The hairs that form the coat of the Racoon are of two kinds, the one of a soft and woolly character, lying next to the skin, and the other composed of long and rather stiff

hairs that project through the wool for some distance. The woolly fur is of a uniform gray, while the longer hairs are alternately marked with black and grayish-white. Upon the top of the head and across the eyes the fur is of a very dark blackish-brown; and upon the knee-joint of each leg the fur is of a darker tint than on the rest of the body. The tail is rather short and bushy in character, and is marked with five or six blackish rings on a dark gray ground. It is nocturnal in its habits, and when standing is plantigrade, that is, it stands on the soles of its feet, but it runs on the tips of its toes. It hibernates in winter.

It eats anything, fruit, chestnuts, grapes, corn, and birds, and is very skillful in sucking eggs; it devours fish, crabs, and oysters, as well as insects. In captivity it shows a propensity for intoxicating liquors. Lawson, the surveyor-general of Carolina, in 1784, says, "It is the drunkenest creature living, if he can get any liquor that is sweet and strong."

In size the Racoon equals a small fox, and it is usually hunted by the aid of dogs till it takes refuge in a tree, from which it is dislodged either by an expert climber, or by felling the tree. Audubon gives the following account of a Coon hunt. "The boys had got up with the dogs, which were baying at a Racoon in a small puddle. We soon joined them with a light. 'Now, stranger, watch and see!' The Racoon was all but swimming, and yet had hold of the bottom of the pool with his feet. The glare of the lighted torch was doubtless distressing to him; his coat was ruffled, and his rounded tail seemed thrice its ordinary size, his eyes shone like emeralds; with foaming jaws he watched the dogs, ready to seize each by the snout if it came within reach. They kept him busy for several minutes; the water became thick with mud; his coat now hung dripping and his draggled tail lay floating on the surface. His guttural growlings, in place of intimidating his assailants, excited them the more, and they closed upon him. One seized him by the rump, but was soon forced to let go; another stuck to his side, but Coon made him yelp pitifully. The Racoon would not let go, but in the meantime the other dogs seized him and worried him to death. To the last he held on to his antagonist's snout. Knocked on the head by an axe, he lay gasping, the heaving of his chest being painful to see. The hunters stood gazing at him in the pool, while all around was, by the flare of the torch, rendered doubly dark and dismal. It was a scene for a painter."

The Coon is easily tamed, but can never be trusted near poultry.



KINKAJOU

PANDA OR WAH

COAITI
RACCOON

AGOUARA

PLATE XXI CARNIVORA

The AGOUARA *Procyon cancrivorus* (Plate XXI), as the South American variety is called, is styled "*Cancrivorus*" or "Crab-eater," as he is even fonder than his Northern kindred of all kinds of crustacea and mollusca. It is larger than our racoon, and its fur has a tinge of yellow, darker or lighter on different parts of the body. The tail is short, and has six black rings on a blackish-yellow ground.

The BLACK-FOOTED RACCOON, *Procyon Hernandezii*, is larger than the common coon, the tail is longer and thinner, and the black rings narrower and better defined. It is found on the Pacific coast and in Mexico.

The CALIFORNIA COON, *Procyon psora*, is, according to Prof. Baird, a mere variety of the above. It was found in the same neighborhood, and Gray, who described and named it as a separate species, never saw anything but a most imperfect specimen.

II.—GENUS NASUA.

The number of species comprised in this genus is still far from settled. Wallace expresses doubt as to the *five* species which he gives in his "Distribution of Animals." The Prince of Wied describes two Brazilian species, but Hensel conclusively shows that they are identical. Tschudi seems to have established *two* species for the Southwest of America.

The animals of this genus have a slender, marten-like body, short neck, and long pointed head; a bushy tail as long as the body, and short, powerful, bare-soled legs. Their conspicuous feature is their nose, which is prolonged over the mouth so as to form a miniature proboscis, which they are in the habit of turning up when they drink to keep it from being wetted more than necessary.

The COATI, *Nasua nasica* (Plate XXI), comes from East Brazil, and is about forty inches in length, of which eighteen belong to the tail. Its thick and pretty long fur consists of stiff bright bristles protruding from a soft, short, woolly coat. The color on the back varies from red to grayish-brown; on the belly it passes into a yellowish shade. The tail has seven rings of dark-brown, and seven of brownish-yellow. The forehead is yellowish-gray, the lips white, the ears yellowish in front, black behind; a round white mark stands over each eye, and a white stripe runs from below the eye down the nose. A curious set of tubercles is found on their feet. The narrow head terminates in a salient, mobile muzzle, and the tongue is soft and extensible.

When wild it resembles the racoon in its habits, and climbs trees with great agility, descending head foremost. It is a nocturnal animal, and a merciless robber of birds' nests. In captivity it is a very amusing and lively creature, very inquisitive and distrustful. One which was in confinement for some time was very tame to its friends, but any stranger who ventured to approach the animal was repelled with open mouth and threatening cries, unless he propitiated the creature by offering it some delicacy of which it was fond. It would then lay aside its suspicious demeanor, and become suddenly confidential, returning the caresses of its newly-found friend, and searching eagerly for a further supply of food. It proved to be quite a useful inhabitant of the house when it was domesticated, for it was accustomed to roam over the premises in chase of mice and rats, which it pursued unrelentingly through house, hay-loft, and stables. It was also accustomed to pay visits into the garden, where it spent much of its time in catching snails and slugs, and in digging after worms—a task for which its powerful claws are eminently calculated to adapt it. When it was supplied with meat, it was accustomed to tear its food to pieces with its claws before carrying it to the mouth; and in the act of feeding, it always supplied itself by hitching one of its claws in the morsel which it was about to carry to its mouth. It struck up a friendship with a little dog, and would permit its four-footed friend to occupy the same bed, but would never endure the society of any other animal. When attacked by men or dogs, the Coaiti fights desperately, inflicting dangerous wounds with its double-edged teeth.

The RED COATI, *Nasua rufa*, differs from the preceding species in its color, which is of a reddish-chestnut tinge, interrupted only by black ears and feet, and maroon-colored bands on the tail.

The WHITE COATI, *Nasua leucorhyncha*, is somewhat lighter colored, having a good deal of fawn color; the snout is yellowish-white.

We need not mention other species; the "Social" and "Solitary" *Nasua* of the Prince of Wied, are identical, the latter being old males which have been expelled from the troop.

III.—GENUS CERCOLEPTES.

This genus contains *one* species of small animals with a long prehensile tail, short toes, and claws more or less retractile. It has caused systematic naturalists great perplexity. At first it was put down as a

Lemur, and called *Lemur flavus*; then it was placed among the Civets, as *Viverra caudivolvula*; at present it possesses a genus to itself, and seems to be intermediate between the Martens and the Bears.

The KINKAJOU, *Cercoleptes caudivolvulus* (Plate XXI), comes from Northern Brazil, and when full grown, attains the size of a cat; but it is much more powerful. Its soft, silky coat is yellowish-gray with a red shade running through it, and marked with indistinct dark bands which can only be seen in certain lights.

The prehensile tail which the Kinkajou possesses renders it a fearless climber; it swings itself from bough to bough with such agility that even a naturalist like Bates mistook it at first sight for a Mirikina (*Nyctipithecus trivirgatus*). It is endowed with a very long, flexible tongue, which it can protrude to a marvellous extent and insinuate into the smallest crevices or the cells of the honeycomb, or can use like an elephant's trunk to seize and draw things towards its mouth. Being a nocturnal animal, its eyes are contractile, and sunlight seems to annoy it very much. During the day it lies buried in deep slumber; at night it becomes extremely lively, and exhibits considerable activity of limb and playfulness of character, running up and down the branches with great skill, uttering at intervals a low, bleating kind of sound, and descending every now and then to drink. In descending it makes use of its hinder claws, turning the feet outward and backward so as to clasp the branch or trunk of the tree, and proceeding head-downward. In its native state its food is of a mixed nature, consisting of fruits, insects, honey, small birds, eggs, and other similar substances. It is easily tamed, and when domesticated is of a sportful nature, delighting to play with those persons whom it knows and trusts, and making pretence to bite, after the manner of puppies and kittens. It is very susceptible to kindness, and is fond of the caresses which are offered by its friends. In its wild state, however, it is a rather fierce animal, and when assaulted, offers such a spirited resistance even to human foes, that it will beat off any but a determined man, supposing him to be unarmed and unassisted.

GENUS BASSARIS.

The animals constituting the *two* species of this genus have been often placed among either the *Viverridæ* or the *Mustelidæ*, but they are now

found to agree in all important respects with the family we are now describing. They are both confined to America.

The AMERICAN CIVET, *Bassaris astuta*, is thus described in the U. S. Pacific R. R. Report: "This beautiful animal, which was formerly supposed to be peculiar to Mexico and Texas, has since been found abundantly in California. The miner calls it the Mountain Cat. It frequently enters his tent and plunders his bag of provisions. When caught, as it often is, it becomes so familiar and amusing, and does so much to relieve the monotony of the miner's life, that it is highly valued, and commands a high price. It is equally efficient as a mouser with the common cat, is much more playful, and to a large number of the members of every community who are cat-haters, might be a desirable substitute." It is abundant in the city of Mexico, frequenting barns and out-buildings, and, like the cat, ravaging pigeon-houses. The Mexican name is Cacamixtli. Prof. Baird says it looks like a mixture of the Racoon and the Fox, having the tail of the former, the head of the latter; its fur is soft, and as long as a fox's, the head pointed, the eyes large, the muzzle long and hairless. The color is a dark brownish-gray, with indistinct marks on the neck and leg; the tail is white, with eight black rings. It is shy and retiring, and seldom goes far from the tree which holds its nest.

A second species has recently been described by Professor Peters from Coban in Guatemala, where it had also been observed by Salvin.

THE PANDAS.

The family of the *ÆLURIDÆ* contains *two* genera, of *one* species each, and the animals comprised in it seem to have their nearest allies in the Coatis and the Bears.

The PANDA, *Ælurus fulgens* (Plate XXI), appears stouter than it really is, from its thick and soft fur; the head is short and cat-like, the long tail is very bushy, the ears small; the short legs have hairy soles, and short toes with semi-retractile claws. The fur is thick, soft, smooth, and very long; on the upper surface of the body it is of a vivid and brilliant chestnut-brown, deepening into a brilliant black on the belly and legs; on the cheeks, muzzle, and chin the hair is white, on the forehead ruddy yellow, the head fawn color, and a chestnut-brown mark runs from the eye to the corner of the mouth, separating the white

muzzle and cheeks; the ears are externally black-red, internally provided with long white hair. The fur is not only handsome in appearance, but is very thick, fine, and warm in texture, being composed of a double set of hairs, the one forming a thick, woolly covering to the skin, and the other composed of long glistening hairs that pierce through the wool, and give an exquisitely rich coloring to the surface of the coat. The hair on the soles of the feet is often snowy-white, contrasting strangely with the black paws.

The Panda or Wah, so named from its cry, is a native of Nepaul, where it lives in the mountains on trees near the Alpine streams, two to three thousand feet above the sea level. The Panda resembles in its habits the common racoon; when angry, it sits up like a bear, and utters a very peculiar snorting noise, although its ordinary voice is like the twittering of a bird. Its food is chiefly vegetable. Simpson, who brought one to London, never saw it eat animal food, and Bartlett says it refused raw and cooked chicken and rabbit, but loved to eat young rose-leaves and buds. The latter took great care of the Panda, and restored it to health, but it never betrayed any gratitude for his exertions. It continued as irritable as ever, assumed a hostile attitude at his approach, and struck about with its fore-paws like a cat. As compared with the other members of the family, the Panda is most like the Kinkajou, in its movements and manner of eating, but the Kinkajou far surpasses it in activity and, to all appearance, in intelligence.

An allied genus, *ELUROPUS*, has been recently described by Milne-Edwards, from the mountains of Thibet; it is larger than the Panda, and its color is nearly all white.



CHAPTER XVI.

THE BEARS.

THE BEARS—THE POLAR BEAR—THE BROWN BEAR—THE SYRIAN BEAR—THE AMERICAN BEARS—
THE BLACK BEAR—THE GRIZZLY BEAR—THE BORNEAN SUN BEAR—THE SLOTH OR LIPPED BEAR—
THE SOUTH AMERICAN OR SPECTACLED BEAR.

THE family URSIDÆ, comprising the Bears, has a tolerably wide distribution: they are absent from Australia and Southern and Tropical Africa, and only one species is found in South America. They are the largest and most powerful of American and European Carnivora. Considerable uncertainty still prevails respecting the generic classification of the bears: we shall follow Wallace, who divides them into *five* genera or sub-genera, and fifteen species.

A glance at the teeth of the members of this family shows that they are omnivorous, and more inclined to a vegetable than to an animal diet; ~~but it is probable that their ferocity is exaggerated, for although they exhibit desperate courage in defending themselves, they seldom seem aggressive.~~ The brain of the bear is highly developed, and they are consequently possessed of considerable intelligence, and soon learn all kinds of accomplishments. Their walk is plantigrade, that is, they place the whole sole of the foot on the ground: they progress at a rapid rate, and soon overtake a man: they can climb and swim excellently: their sense of smell is very acute. When attacked they stand upright, and strike with their forepaws, which carry long and sharp claws, they parry wounds, and are remarkably dangerous from the fearful energy they display in the very last moments of life.

I.—GENUS THALASSARCTOS.

The POLAR BEAR, *Thalassarctos maritimus* (Plate XXII), is the *only* representative of the genus. It is ~~almost~~ entirely carnivorous, its food



POLAR BEARS

consisting of fishes and seals, which it captures skilfully. It can swim long distances, and has been seen swimming steadily across a strait forty miles wide. Its fur is of a silvery white, tinged with a yellow hue rather variable in different specimens; the claws are black, the neck is very long in proportion to the body, and the head is small, sharp, and almost snake-like. The foot is equivalent in length to one-sixth of the entire length of the body, and the sole is covered with thick fur.

The Polar Bear has a most acute sense of smell, which enables it to detect the breathing holes which the seals make through the ice, even when the snow is lying thickly over them. After its repast it lies down to sleep, and is often carried off to sea on the moving ice-fields; one was observed two hundred miles from land, and as fish are not easily caught at sea, it doubtless had a hard time. Sometimes whole herds of Polar Bears have been carried by drift-ice to civilized shores, where they prey on sheep and cattle, to the dismay of their unwilling hosts, and are said not to hesitate to attack man. Instances have been known where they have pursued hunters back to their ships, and tried to make their way into the cabins through the port-holes.

The Polar Bear dreads heat, and in a climate like ours requires to have daily poured over it, winter and summer, sixty to eighty pails of water. It always remains wild and savage, and even when caught young, can be only very slightly tamed.

Its flesh is very good, and the animal is hunted for it by the natives as well as by all whale-fishers and Arctic explorers; but the liver must be avoided; Kane, for an experiment, tasted the liver of a newly killed animal, and became seriously sick in consequence.

It is said that the female of this genus hibernates, but that the male continues in the active exercise of all his faculties. The Polar Bear sometimes attains the length of nine feet, and the average is over eight feet. Ross weighed one which had lost thirty pounds of blood, and it tipped the scale at 1131 lbs., while Lyon saw one that weighed sixteen hundred pounds.

II.—GENUS URSUS.

The *twelve* species which constitute this genus are found in all the northern regions of the globe from the arctic circle to Mount Atlas and the Gulf of Mexico, and present a striking similarity over this extensive region.

The BROWN BEAR, *Ursus Arctos* (Plate XXIII), is found in the old world from Spain to Kamtschatka, and from Lapland to Mount Atlas, and is only absent from Belgium, Denmark, England, Germany, and Holland. It requires for its dwelling large unfrequented forest lands rich in fruits and berries, for it seldom attacks cattle. Ants are a favorite food; it scrapes their nests up with its powerful claws, and devours them and their eggs, and, as is well known, it is especially fond of honey: these, however, are but luxuries, its staple food consists of cranberries, blueberries, strawberries, and the like. But when it is unable to find vegetable sustenance, it exhibits a taste for flesh, and will attack sheep and goats, or devour carcasses that fall in its way. When rendered desperate by the pangs of hunger, it will assail the benighted traveler; even when he seeks to protect himself by a ring of fire, the bear dips himself in the nearest stream, then returns with his thick fur well saturated with water, and rolls over the burning embers, extinguishing them effectually. This curious fact is well known to the natives of Siberia, so that they have good ground for the respect in which they hold the bear's intelligence.

During the autumn the bear becomes fat, and makes preparations for hibernating. A curious phenomenon now takes place in the animal's digestive organs, which gives it the capability of remaining through the entire winter in a state of lethargy, without food, and yet without losing condition. As the stomach is no longer supplied with nourishment, it soon becomes quite empty, and, together with the intestines, is contracted into a very small space. No food can now pass through the system, for a mechanical obstruction—technically called the “tappen”—blocks up the passage, and remains in its position until the spring. The “tappen” is almost entirely composed of pine-leaves, and the various substances which the bear scratches out of the ants' nests.

It remains in its den till the middle of April, and is said to emerge as fat as when it entered, unless it has lost the “tappen” too soon. During the winter, the bear gains a new skin on the balls of the feet, and Mr. Lloyd, who has studied their habits carefully, suggests that the curious habit of sucking the paws, to which bears are so prone, is in order to facilitate the growth of the new integument.

In old days, bear-baiting was a favorite amusement of royalty. Queen Elizabeth was a constant patron of the sport, and in the last century, Augustus the Strong, the king of Poland, was ardently devoted to

it. But the improvement of manners has abolished this cruel amusement, and the bear is only called upon to display his talents by dancing and going through the platoon exercise.

Bears are seen in all Zoological Gardens, and the Swiss city of Berne keeps several in honor of its name. The bear in captivity is usually gentle, and takes cakes and food from visitors. The bear's name in "Reynard the Fox" is "Bruin," but in Paris all bears at the Jardin des Plantes are called "Martin." They derive this name from a celebrated fellow-captive. He was unrivaled at begging and catching in his mouth the pieces thrown to him. He earned his glorious fame by killing a soldier. This man saw something shining in Martin's den, and mistook it for a piece of gold. He foolishly went down to pick it up, but it only turned out to be a brass button; Martin attacked and killed him, and from that day became a prominent character in the Jardin des Plantes.

The SYRIAN BEAR, *Ursus Isabellinus* (Plate XXIV), is possessed of a coat which in youth is a grayish-brown, but in mature years, white. The hair is long and curled, and hides a thick woolly fur, while at the neck and shoulders it projects like a mane.

To this species belonged an animal which enjoyed a high reputation at Oxford and elsewhere, on account of his singularly gentle and amusing manners. The bear, which was generally known by the name of "Tig," being an abbreviation of the somewhat lengthy name of Tiglath-Pileser, was for some time a noted celebrity in Oxford, whither he was brought in his early boyhood. High-spirited and rather tetchy in temper, he was very affectionate to those who treated him with consideration, and was perfectly amenable to proper discipline; he was accustomed to don a regulation cap and gown, and under this learned guise to perambulate the college, and partake of the hospitality of its members.

On one occasion he contrived to escape from bondage, and made at once for a candy-store. The owner took to flight at his entrance, and when his pursuers entered they found Mr. Tig seated upon the counter, helping himself to broken sugar with a liberal paw, and displaying such an appreciation of his good fortune that it was not without much trouble that he was removed from the scene of his repast. He was rather peculiar in his tastes, and had attained to a highly civilized state of epicureanism, for his chief delicacies were not, as might be supposed, the produce of the garden or the field, but the more sophisticated dainties of hot muffins and cold ices. He was a most social animal, and if left

alone, even for a short time, would cry and lament in the most pitiful of tones.

The fur of this animal is valuable for its warmth and beauty, and the Syrians still believe in the medicinal virtues of its fat. Even in Europe "Bear's Grease" was for a long time considered a specific for various injuries: but at present it is only heard of in hair-dressers' shops.

THE AMERICAN BEAR.

The BLACK BEAR, *Ursus Americanus* (Plate XXIII), had formerly a great range of country, and was once so common in New York State, that the city had a bear-market. It is a very inoffensive animal, and lives chiefly on fruit, insects, and small animals. Audubon says, contrary to the usual opinion, that it will prefer flesh to fruit any day, and confirms the statement that it is fond of fish. The Black Bear is small and of a uniform black or brown color, and is hunted for its fur and fat, which have a commercial value, as well as for its flesh, which is smoked before it is sent to market. Its weight rarely exceeds three hundred pounds. It is chiefly found in mountains and thickets, or in the cane-brakes of the South, and gives good sport when hunted with dogs, as it runs pretty quick, and then takes to a tree. It is really no more dangerous to the hunter than a hog of the same size would be.

As a general rule, they will never fight a man unless forced into it. When they have cubs, and are followed closely, they will keep them ahead and follow close in the rear to protect them. If pushed closely, they will make a great show of fight, growl, and tear the bark from the trees with much fuss and noise, and do their utmost to frighten off the enemy; and, if there is no help for it, they will fight fiercely when brought to bay. Bears when known to be with young are left alone, unless the hunters are well armed for a fight. Experienced dogs greatly assist the hunter, and do much toward checking the speed of the bear. Now and then they nab Bruin by a hind-leg, which worries him greatly. After a dog has tackled a bear once, however, he knows enough to keep out of the reach of his paws, and, being nimbler than Bruin, he has little trouble in avoiding his grasp.

It is said that instead of becoming extinct among the Catskills, bears are more numerous now than ever before. A well-known trapper gives as his reason for this that a number of years ago, when the mountains



BROWN BEAR

GRIZZLY BEAR

BLACK BEAR

were well timbered, the bears could scarcely find anything to eat, and had to live on roots, bark, and whatever game they could lay their paws on. Since the wood has been cleared off, shrubs and bushes have grown thickly, intermingled with briars and trailing vines, which furnish berries and other food, capable of sustaining considerable numbers.

Although the white hunters chase and kill the bear without any remorse of conscience, the copper-colored races are so impressed with the intellectual powers of this cunning and dangerous animal, that they endeavor to appease the manes of a slaughtered bear, or Musquaw, as they call it, with various singular and time-honored ceremonies. The head of the slain animal is decorated with every procurable trinket, and is deposited ceremoniously upon a new blanket. Tobacco-smoke is then solemnly blown into the nostrils of the severed head by the successful hunter, and a deprecatory speech is made, in which the orator extols the courage of the defeated animal, pays a few supplementary compliments to its still living relations, regrets the necessity for its destruction, and expresses his hopes that his conduct has been, on the whole, satisfactory to the dead Musquaw and its relations.

This curious custom is the more remarkable, as it bears a close analogy to the belief of the Scandinavians, who are little less fastidious in their conduct towards the bear. No true Norwegian will ever speak of a bear as a bear, but prefers to mention it as "the old man with the fur cloak;" or, more tersely and poetically, the "Disturber."

The CINNAMON BEAR, *Ursus cinnamomeus*, is a variety of the Black Bear; its hair is rather longer and softer, and its color a dark chestnut with purple shades.

THE GRIZZLY BEAR.

The GRIZZLY BEAR, *Ursus ferox* (Plate XXIII), is the most terrible animal on this continent, the largest of American Carnivora. It is found over all North-western America, most abundantly on the slopes of the Rocky Mountains. In the fall it comes down from its usual dwelling in the mountains, and hunts for berries, grapes, and wild fruit in the plains. General Dodge says the Grizzly is very shy, and takes to cover at the slightest suspicious circumstance, always running away if it can, and never attacking except when cornered or wounded. In that case its assault is furious, and quite regardless of the number of its foes, and

then its size and strength, its immense teeth and claws, its tenacity of life and ferocious determination render it a terrible antagonist to the bravest and coolest sportsmen.

The Grizzly Bear varies in color; some specimens are of a dull brown, flecked with gray, while others are of a steely-gray; but the grizzled hairs are always conspicuous. The length of a full-grown male is about eight feet and a half, and the girth the same, while the weight is about eight hundred pounds. The fore-limbs are very powerful, the feet measuring eighteen inches, and the claws five inches; these claws are very sharp, and cut like chisels; the head is large, the tail very short and quite hidden in the fur. The gait of the Grizzly is awkward and rolling; when young it can climb trees; fortunately, however, as it increases in size and weight, it loses this power, its claws being unable to sustain its unwieldy bulk.

The Grizzly is the king of all our animals, and can destroy by blows from his armed paws even the powerful bison of the plains; wolves will not even touch the carcass of this dreaded monster, and, it is said, stand in such awe, that they refrain from molesting deer that he has slain. Horses also require careful training before they can be taught to allow their hide to be placed on their backs.

Terrible stories are told of encounters with Grizzlies. General Dodge says one of the most complete wrecks of humanity he ever witnessed was a huntsman for a party of California miners. He suddenly, one day, came face to face with a Grizzly; the bear stood up on its hind-legs, the man presented his rifle, and stood waiting the attack. The bear advanced, and took the muzzle of the rifle in its mouth, the man fired, and before he had time to think was in the bear's clutches. "It was all over in a second," the narrator stated; "*I didn't feel any pain*, and I didn't know nothing more till I come to next day." His companions found the man and the bear together, the latter dead with a bullet in the brain; the man had received only one stroke from each paw. One fore-paw had passed over the shoulder, and a claw had hooked under the shoulder-blade and torn it out entirely; the other fore-paw tore all the flesh from the left-side; a hind-claw had torn open the abdomen, letting out the bowels, while the remaining hind-paw had torn away the muscle of the right-leg from groin to knee. The man recovered, and when he described the fight to the General, added, "Anybody can fight bear that wants to; I've had enough grizzly."

The same officer tells of a remarkable escape. A she-grizzly overtook a sportsman and knocked him senseless with one blow; she then smelt him carefully, and being satisfied that he was dead, retired. His friends, who had remained at some distance, were just about to proceed to recover his remains, when the body sprang to its feet and made the best possible time to the top of the hill where they were standing. This man was not injured, his clothes only having been torn off; he reported that he came to his senses while the bear was smelling him.

Dr. Parker Gillmore had a regular duel with a Grizzly. The bear was standing up behind a tree; as it peeped round the trunk the sportsman fired, but the bullet only smashed a paw. The bear fell, but rose again in an instant, and went for the aggressor; he fired again, but the result was only a momentary recoil, the gun was sent flying, and he was prostrated. Two or three stabs from his sheath-knife settled the monster. Fortunately, before Gillmore came to close quarters, the bear had one fore-paw smashed, and his lower jaw splintered.

III.—GENUS HELARCTOS.

This genus comprises only *one* species, which is called the "Sun-bear," because it has the very unbearlike habit of basking in the sun. The generic name, *Helarctos*, is compounded of the Greek words *Helios* "the sun" and *arctos* "bear." The Sun-bears are found in the mountains of Nepaul, and in the Malay archipelago.

The BORNEAN SUN-BEAR, *Helarctos Malayanus* (Plate XXIV), is not a large animal, measuring when full grown about four feet and a half; but it is powerful for its size, and is armed with very long claws. The head is thick, and the neck remarkably developed in comparison with the head: the eyes are small and lively, but the ears are large. The fur is very fine and glossy, of a deep black color, with the exception of a crescent-shaped patch of white on the breast, which, in some varieties, is of a fulvous yellow hue. It feeds chiefly on vegetables and honey, and is very destructive to the young cocoa-trees. It is called in Java the "Bruang."

It is easily tamed. Sir Stamford Raffles, who possessed one of these bears, permitted it to live in the nursery, and never was obliged to chain, chastise, or otherwise punish the good-tempered animal. Being some-

thing of an epicure, and often admitted to his master's table, the Bruang would refuse to eat any fruit except mangosteens, or to drink any wine except champagne. It may seem remarkable that a bear should display any predilection for fermented liquids, and more so that it should be so fastidious as to select champagne as the wine which it honored with its preference. Such, however, was the case, and the animal was so fondly attached to the champagne-bottle, that the absence of his favorite liquid was the only circumstance that would make him lose his temper. His affectionate disposition led him to extend his friendship to various of his acquaintances, and he was on such excellent terms with the entire household, that he would meet on equal footing the cat, the dog, and a small Lory, or Blue-mountain bird, and amicably feed with these domestic favorites from the same dish.

One of these bears that was successfully domesticated was able to eat animal as well as vegetable food, but was fed exclusively on bread and milk, of which it consumed rather more than ten pounds per diem. It is possessed of much flexibility of body, and is very fond of sitting on its hind legs, thrusting out its long tongue to an extraordinary distance, and ever and anon withdrawing it into the mouth with a peculiar snapping sound. While thus engaged, it makes the most grotesque and singular gestures with the fore-limbs, and rolls its body from side to side with unceasing assiduity.

IV.—GENUS PROCHILUS.

The *one* species of this genus is found from the Ganges to Ceylon, and is characterized by a short thick body, short limbs, and large feet armed with enormous sickle-shaped claws. It is usually found in the mountains, and is equally dreaded and admired by the natives.

The SLOTH BEAR, *Prochilus* (or *Melursus*) *labiatus* (Plate XXIV), is nearly five feet long. Its flat, low-browed head is prolonged into a narrow-pointed proboscis-like snout of very peculiar construction, and the nostrils and lips are very mobile; the latter can be so protruded and contracted that they form a kind of pipe nearly as useful as a trunk. Through this lip-pipe the long, thin, flat tongue is constantly shot out, so that the animal can draw things near it, and then suck them up. The hair is very long, of a deep black color with some brownish hairs, and a



SYRIAN BEAR

SLOTH BEAR

BORNEAN SUN BEAR

PLATE XXIV CARNIVORA

forked patch of white on the breast. When it walks, its fore-legs cross each other; its feet are remarkably sensitive, and soon blister.

This bear is liable to lose its incisor teeth, a peculiarity which led earlier writers to class it among the *Edentata*, and style it a Sloth. It is called indifferently the Sloth Bear, the Jungle Bear, the Lipped Bear, or the Honey Bear. The Hindoo name is Aswail. It is very sensitive to heat, and remains in its den during the noontide glow; its diet is chiefly vegetable, the exceptions being honey and oats. Its flesh is in much favor, and is said to be very good.

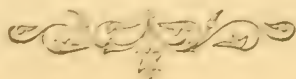
When captured young, it is easily tamed, and can be taught to perform many curious antics at the bid of its master. For this purpose it is often caught by the native mountebanks, who earn an easy subsistence by leading their shaggy pupil through the country, and demanding small sums of money for the exhibition of its qualities. On account of its association with these wandering exhibitors, it has been called by the French naturalists "*Ours Jongleur*." Whether owing to the natural docility of the animal, or to the superior powers of its instructor, it performs feats which are more curious and remarkable than the ordinary run of performances that are achieved by the Learned Bears of our streets.

V.—GENUS TREMARCTOS.

The solitary species of this genus is isolated in the Andes of Chili and Peru, and is commonly known as the *Ursus ornatus*.

The SPECTACLED BEAR, *Tremarctos ornatus*, is black, with the exception of two yellow marks above the eyes; as these are of a semicircular shape, they suggest the common name. Little is known of its habits in its wild state, and it has not been domesticated.

One curious detail in the physiology of all the bears is the extraordinary smallness of the young at birth, compared with the bulk of the parents, for they are not larger than cats. The mother has, like the cat, the habit of licking her cubs with her tongue to clean them, and she performs this highly necessary operation so assiduously that a legend has arisen that "she licks them into shape."



CHAPTER XVII.

THE EARED SEALS AND WALRUSES.

THE EARED-SEALS—THE FUR SEALS AND HAIR SEALS—THE SEA-LION—THE SEA-BEAR—VALUE OF ITS FUR—THE FUR SEALS—THE CALIFORNIA HAIR SEAL—THE CALIFORNIA OR NORTHERN SEA LION—MANNER OF CAPTURING IT ALIVE—THE WALRUS.

THE family OTARIADÆ comprises the sea-bears, sea-lions, and eared-seals. These animals are divided by Wallace into *four* genera, but Mr. Allen, in his paper in the "Bulletin of the Harvard Museum," arranges them into five. They are confined to the cold and temperate shores of the North Pacific and similar regions in the Southern Hemisphere.

The Eared Seals, as the OTARIADÆ are commonly called, form a distinct family from the Earless Seals, or *Phocidæ*; they can walk on their limbs with the body raised from the ground, and they rest with their hind-legs bent forward; they cannot swallow under water, and come to the surface during the process of mastication; the pupil of the eye dilates and contracts to an enormous extent. Mr. Allen divides the Eared Seals into two sub-families, the *Trichophocinæ* or Hair Seals, and *Oulophocinæ* or Fur Seals; but Dr. Gray objects to this classification as overlooking the fact that the abundance of the under-fur depends on the season of the year, and the age of the animal. In ordinary parlance the distinction between Hair and Fur Seals is common; the latter are hunted for fur as well as their oil, as they furnish the seal-skin jackets of fashion. These furs differ much in appearance; in most species the hairs are much longer than the under-fur; in others, they only slightly overtop the soft woolly fur, which is very dense, forming a soft, elastic coat. Their habits resemble those of the Earless Seals. The young are brought forth far inland, and are taught to swim very gradually, their dams devoting much time to this duty. They are naturally quiet and peaceable animals, and have no dread of mankind.

I.—GENUS OTARIA.

This southern representative of the Sea Lions is found on the coasts of South America, and the islands southward as far as Graham's Land. It is very abundant in Tierra del Fuego and the Falkland Islands. It seems to perform annual journeys of considerable length to reach its breeding-places, where the females bring forth and nurse their young for some time before leading them into the water. There is only *one* species of this genus, which is the *Phocarcus* of Gray.

The SEA LION, *Otaria jubata* (Plate XXV), attains the length of about nine feet; its fur generally lies flat, but on the neck and shoulders is developed into a short mane, which gives the creature a leonine aspect. The head is of a yellowish-brown color, the muzzle black, the back yellowish-gray, the hairless paddles look black. The female has a darker color, and is without a mane.

The Otariæ are not pursued so zealously as the rest of the family, their skin being comparatively worthless, and their oil scarcely repaying the cost incurred in taking them.

II.—GENUS CALLORHINUS.

The *only* species of this genus is an animal found on the coasts of Kamtschatka and Behring Straits and California in the North, and of Patagonia in the South, having thus a very wide distribution. It is characterized by an elongate skull, round forehead, and small, narrow fore-flippers. It is a Fur Seal.

The NORTHERN SEA BEAR, *Callorhinus ursinus* (Plate XXV), is the *Otaria ursina* of Peters, and the *Arctocephalus Californianus* of Gray. It attains the size of eight to nine feet, the females, however, being only half that length. The head is long, the neck short but clearly distinguished from the body, the tail short, the mouth small, the eye large, dark and lively. The coat consists of somewhat stiff hairs, with very soft, delicate silky fur thickly covering the skin. The ground color is a dark brown, sprinkled with white-tipped hairs on the head and neck. The fur is of a reddish tint. Old females are of a silver-gray color, and the young of both sexes have a silvery coat.

The Sea Bears, like the Otariæ, are migratory, but it is not known where they pass the winter; they return in spring, each family to the same spot for years in succession; an Indian chief in Alaska observed a male that had lost one of its flippers come back to the identical rock for seventeen years. Steller writes that each male has eight to fifteen females, whom he watches jealously, and, although on the coasts where they were observed these seals were lying in thousands, yet each family kept distinct; such a family, consisting of an old male, his wives, his sons and daughters, and yearlings which had not yet paired, amounts often to one hundred and twenty. The females bring forth usually two cubs, which are covered with very fine brilliant black wool, and which play about like young dogs, while the father looks placidly on, only interfering when a quarrel takes place, in which case he always caresses the conqueror. The males also fight among themselves for the possession of the females, or a resting-place on the shore; old defeated males are often found leading a solitary life, and they are bad-tempered and vicious. Their cries are of three-sorts; when unoccupied, and on land, they low like cows that have lost their calves; when fighting, they growl like bears; when victorious, they utter repeatedly a loud scream which Steller compares to the note of a house-cricket; when wounded they spit like cats. The males kiss the females, according to the same observer, and wag their hind-flippers as a dog does his tail. They are very active, and swim ten to twelve knots an hour. They are very tenacious of life, and will stand before dying two hundred knocks on the head.

The Sea Bear is especially hunted for his fur, and, fortunately, any number of these seals can be obtained. On St. Paul's Island there were twelve miles of coast occupied by these creatures with an average width of fifteen rods. Allowing twenty seals to the square rod, we have the number of breeding seals as 1,152,000: deducting one-tenth for males, there remains 1,037,800 females. The Russian Fur Company used to pay to the fishers ten cents a skin, the skin when salted being worth three dollars. This price fluctuates with the fashions of the day. When Alaska was transferred to us the price of seal-skins rose to seven dollars, but in 1871 it fell again to three dollars. In 1873, it is estimated that 145,000 were taken, and the net value of the fishery is put down at \$1,175,000 per annum. Besides the skin, each seal yields a gallon and a half of oil. The chief time for hunting is from June to September. The skins of the young are much prized for clothing.

III.—GENUS ARCTOCEPHALUS.

The seals of this genus are usually divided into *three* species, but there is considerable difference of opinion as to how far subdivision should go. The name *Arctocephalus* is formed from two Greek words, and means "Bear-head." All the species are Fur Seals, and of great commercial value.

The CAPE FUR SEAL, *Arctocephalus Antarcticus*, is found near the Cape of Good Hope. Gray gives the following descriptions in his "British Museum Hand-book": "(1.) Adult male, slight mane, called 'Large wig;' fur whitish, under-fur reddish. (2.) Adult without mane, called 'Middleling;' fur reddish-white, under-fur reddish. (3.) Young, called 'Black-pup;' fur black and polished, under-fur brown and very thin."

The SOUTHERN FUR SEAL, *Arctocephalus nigrescens*, is found at the Falkland Islands. It is the *Arctocephalus Falklandicus* of Allen, and is peculiar to America.

The AUSTRALIAN FUR SEAL, *Arctocephalus cinereus*, is black, with an abundant reddish-brown under-fur.

The chief distinction on which classifiers rely for this distribution into species, is the position of the fifth grinder in the upper jaw. The Southern Fur Seal is the only one of importance in a commercial point of view. It is remarkable for the closeness and elasticity of its short and even fur, which can be worn without removing the long hairs. When these, however, have to be removed, it is done by shaving the fleshy side of the skin till the deep roots of the long hairs are severed, when the hairs fall out.

IV.—GENUS ZALOPHUS.

The chief representative of this genus, of which *two* species are known, is

The CALIFORNIA HAIR SEAL, *Zalophus Gillispiei*, which is found in the North Pacific and on the coasts of Japan and California. The under-fur is very thin. Gray communicates the interesting fact that a line drawn across the palate at the front edge of the zygomatic arch leaves one-third of the palate behind the line.

The AUSTRALIAN HAIR SEAL, *Zalophus lobatus*, has very little under-fur, and small toe-flaps. Its upper grinders are all single-rooted, and the sixth molar is absent.

We add to these species of Hair Seals one which is still waiting for classification. The specimen on which Gray labored had no head, and therefore he is unable to give us his usual charming details about molars and zygomatic arches.

The CAPE HAIR SEAL, *Arctocephalus? nivosus*, has very black, short fur with small white spots. It differs from *Arctocephalus Antarcticus* in the length of the hair, and by having no under-fur.

V.—GENUS EUMETOPIAS.

The *one* species is found in Behring Straits and on the coast of California. It has no under-fur, and the flap of the toes is very short.

The NORTHERN SEA LION, *Eumetopias Stelleri*, was called by Steller himself *Leo marinus*. The jaw is much more elongated than in the *Otaria jubata*. This is the SEA LION OF CALIFORNIA. It reaches the enormous size of fifteen feet, and weighs sixteen hundred pounds; the eye is large and expressive; the limbs, which discharge the duties of legs, feet, and fins, are covered with a rough, horny skin, while the rest of the body is hidden in a short, hard, brilliant coat of hair. The males are of different colors, the females are usually light brown, and only half as large as their partners, while the lordly male has around its neck a heavy mass of stiff curly hair, which gives it a lion-like look. During the autumn, great numbers are found at Behring's Island, and in July it comes down the American coast. The male confines himself to three or four females.

They are very ferocious in aspect, but in disposition very peaceable or even sluggish, and fall an easy prey to the hunter, great numbers being slain by the natives by means of harpoons and poisoned arrows, when they come ashore to breed. Their sojourn on shore lasts about four months on the California coast, and a few years ago thousands of barrels were annually filled with their oil. In consequence of the visible diminution of their numbers, at present only males are killed. South of Santa Barbara, there rises a rocky ledge accessible on one side; here, when the sun goes down, fifty to a hundred males will congregate till morning. If a boat approaches, they glide into the water, and wait



TRUE SEAL

WALRUS
CRESTED SEAL

HARP SEAL

PLATE XXV CARNIVORA

there till the human foe has departed. One day, however, a landing was successfully effected by pulling against the wind, and the poor brutes were massacred, for a seal-hunt is a mere butchery of unresisting victims. At present the authorities of California carefully preserve the Seal Rock, which has become one of the natural curiosities of San Francisco.

Sea Lions are in demand for menageries and aquariums all over the world. Captain Mullett, who supplies this demand, gives an interesting account of the method of capture.

"Our field of operations is on the lower or Mexican coast of California, as we are not allowed to catch the lions in American waters. We are therefore compelled to operate off San Diego, which is the dividing line of California and Mexico. Our method of capturing the lions is this: They go in rookeries of one hundred or more, and we watch the shore to see where they will go into camp. This we can determine from the fact that they carry their young on shore, leave them, and go back to the water, returning at break of day. When we find a camp, we dig trenches in the sand to hide in, or if there are rocks convenient, we hide behind them. The vessels are anchored some distance off the shore, and we bring from them in small boats cages made of six-inch fencing-boards. When the herd comes ashore, the lassoers watch their opportunity, and lasso one of the lions around the neck. Another lasso is then fastened to one of the hind-flippers, and the lion is forced into one of the cages. This must be done within a short time, or the animal will not live. I give orders that if twenty minutes elapse from the time the animal is lassoed until he is in the cage, the men must let him go. This is necessary, from the fact that if kept longer, they struggle and strain themselves so that they die within a few days afterwards. After the lion is captured, a shot, to which a long rope is attached, is fired from a bomb-gun on the shore over the vessel; the other end of the rope is attached to one of the cages, and it is pushed into the breakers and hauled out to the vessel. On board the vessel the lions are not put in water, but are kept wet with a sprinkler. They are then taken to San Francisco, where they are placed in cars built for the purpose, and transported across the continent, each car containing twelve lions."

THE WALRUS.

The family of the TRICHECHIDÆ comprises only *one* genus and *one* species, the well-known Walrus or Morse. It is a very characteristic

animal of the North Polar Regions, and is seldom found straying south of the Arctic Circle, except on the coasts of North America, where it sometimes reaches latitude 60° . It is most abundant on the shores of Spitzbergen, but it is not found between longitude 80° and 160° east, or between 100° to 15° west of Greenwich.

The WALRUS, *Trichechus Rosmarus* (Plate XXVI), which is also commonly called the Sea Horse, is truly a monster of the deep. When fully grown, it has been known to reach a length of from twenty to twenty-four feet, and weighs two thousand to three thousand pounds, but is usually rather smaller. Its huge body is thickest in the middle, but does not taper down to the tail so finely as in the seals; the powerful limbs project outwards and downwards to such an extent that the elbow and knee-joints are plainly to be seen; the feet have all five fingers, with short blunt claws which do not reach the end of the fingers; the tail is a mere flap of skin. The head is small, the muzzle short, the upper-lip fleshy, the under-lip swollen, on both sides of the muzzle is a considerable number of round, stiff bristles, and in front there protrude two enormous tusks two feet and upwards in length, growing downwards from the upper-jaw. The skin is nearly devoid of hair, and of a liver-brown color.

The Walrus has been long known, and has formed the subject of countless fables. Albertus Magnus says that in the North Sea is a whale-elephant that climbs up rocks with its tusks. The fishermen come up to it when it is asleep, raise the hide near the tail from the blubber, and make it fast with a rope to the rocks. They then pelt the creature with stones; upon which it drops out of its skin and falls into the sea, where it is helpless. Olaus Magnus adds his quota of legend. A few centuries ago, the Walrus was found much farther to the south than it is now; Hector Boece describes it as being a regular visitor of the Scotch coasts, and stray ones have been seen on the shores of the Orkney islands and the Lewis as late as 1857. The swimming powers of the Walrus would enable it easily to accomplish such a journey, but it is, more than all other animals of its kind, restricted by the necessity of procuring food to certain regions. It avoids the deep sea, and sailors know that the sight of one is an indication of land in the neighborhood, for experience has told them that it seldom leaves the pack-ice round the islands. There vast herds are found, as many as seven thousand having been seen in a single herd, clambering in endless succession on to the shore. A single ice-floe often has twenty walruses sleeping on it. When the herd is

reposing, one of them remains on guard, and at the first sign of danger wakens his comrades with his terrible roar, and then the whole party either take to flight or prepare for war; and they are no cowardly foes!

Scoresby writes: "The Walrus is a dauntless creature; he examines an approaching boat with curiosity, not with dread; an attack on one is resented by all the herd; they gather round the boat, dash their tusks through its sides, or suspend themselves by them on the gunwales." "I was once," Brown relates, "in a boat where a walrus was harpooned; it dived at once, but rose again immediately, and in spite of our lances, axes, and muskets, sent its tusks through the sides of our boat, so that we were glad to cut the harpoon-line, and escape to the ice-floe which the walrus had left." Another whale-fisher was pursued by a herd, and when he landed, was regularly besieged. In all cases it is dangerous to meddle with this monster while he is in the water, while its vigilance renders it a difficult task to reach it on land.

A Walrus is a valuable animal, for its skin, teeth, and oil are in much request, while among the Esquimaux its body furnishes them with almost every article in common use. Among civilized men, the skin of the Walrus is employed for harness and other similar purposes where a thick and tough hide is required. The tooth furnishes very good ivory, of a beautiful texture, and possessing the advantage of retaining the white hue longer than ivory which is made from the elephant-tusk. The tusks are sometimes two feet in length, and seven inches in circumference, weighing ten pounds each, but usually attain only half this size. The oil is delicate, but there is very little to be obtained from each Walrus, the layer of fatty matter being scarcely more than a hand's-breadth in thickness. Fish-hooks are made from its tusks, its intestines are twisted into nets, its oil and flesh is eaten, and its bones and skin are also turned to account by the rude but ingenious Esquimaux.

The food of the Walrus consists chiefly of various kinds of mollusca, and it seems probable that the chief use of its formidable tusks is to scrape these shell-fish from the rocks. The Walrus has other than human foes: the Esquimaux speak of its terrible combats with the Polar Bear, and say that when the latter has seized one, the Walrus throws itself and its enemy together into the sea, and drowns him.

The number of young which the Walrus produces at a litter is seldom if ever more than one, and when newly born, the little animal is about the size of a yearling pig. Winter is the usual time of year for the

appearance of the young, and the mother always repairs to the shore or to the ice-fields for the purpose of nourishing her family. The maternal Walrus is very attentive to her charge, and while in the water is very solicitous about its welfare, carrying it about under her fore-limbs, and defending it from any danger that may arise, regardless of her own safety in watching over that of her offspring. When a mother Walrus is surprised upon the shore, she places her young one upon her back, and hurries away to the sea, bearing her precious burden.

The English name of this strange creature, *Walrus*, means "strange horse," the specific title *Rosmarus* is a Latinized form from the Norwegian name *Rosmar* or "Sea-horse"; the appellation "Morse" seems derived from the Lapp name "*Morsk*."

A very full account of the Walrus is given by Dr. Kane in his "Arctic Explorations," to which we refer our readers who desire further information.



CHAPTER XVIII.

THE TRUE SEALS.

THE COMMON SEALS—THEIR WIDE DISTRIBUTION—THEIR HABITS—THEIR LOVE OF MUSIC—ROBBIN'S REEF—THE CASPIAN SEAL—THE HOE-RAT—THE HARP-SEAL—RICHARD'S SEAL—THE BEARDED SEAL—THE GRAY SEAL—THE WHITE-BELLIED SEAL—THE SEA LEOPARD—THE CRAB-EATING SEAL—THE FALSE SEA LEOPARD—THE LARGE-EYED SEAL—THE SEA ELEPHANT—THE CRESTED SEAL—THE WEST INDIAN SEAL.

THE family, PHOCIDÆ, or True Seals, is pretty equally divided between the Northern and Southern Hemispheres, frequenting almost exclusively the cold and temperate regions. The absence of an external ear, the short limbs which seem stuck into the body, the hairy flippers, and the teeth, distinguish the animals of this family from the Eared Seals already described.

They are usually divided into *thirteen* genera, and Gray groups these genera into five sub-families, the first of which (the sub-family of the PHOCINÆ), contains *five* genera.

I.—GENUS CALLOCEPHALUS.

The *three* species of this genus are distributed over the coasts of Greenland, the North Sea, and the Caspian Sea, and also in Lakes Aral and Baikal, and the occurrence of seals in these inland waters is a fact of peculiar interest. In the case of the Caspian and Lake Aral, it is remarked by Wallace, that as they are connected with the Northern Seas by extensive plains of low elevation, a depression of less than five hundred feet would open a communication with the ocean. At a comparatively recent epoch, a gulf of the Arctic Sea must have extended to the Caspian till the elevation of the Kirghiz steppes cut off the passage.

Lake Baikal offers greater difficulties, for it is a fresh-water lake situated in a mountain district two thousand feet above the sea-level,

and separated from the plains by several hundred miles of high land. Mr. Wallace adds: "We are accustomed to look at seals as animals which exclusively inhabit salt water, but there seems no reason why fresh water should not suit them, provided they find in it a sufficiency of food, facilities for rearing their young, and freedom from the attacks of enemies. Mr. Belt's ingenious hypothesis that during the Glacial epoch the northern ice-cap dammed up the waters of the northward flowing Asiatic rivers, and thus formed a vast fresh-water lake which might have risen as high as Lake Baikal, seems to offer the best solution of the curious problem."

The true seals keep closer to the coast than the eared-seals, and are rarely seen over thirty nautical miles from land. On land their movements are awkward—they cannot walk like the eared-seals, but only shuffle along; in the water they are perfectly at home, working their fore-flippers as a means of propulsion, while the hind one seems more used to steer by, and swimming with great speed. They are often seen sporting in the sea, leaping in and out of the water, racing in circles, and so occupied with their pursuits that a fisher can approach them unperceived. When alarmed, they dive, but do not stay very long under water, coming to the surface to breathe once a minute, on the average, and perhaps never remaining more than six minutes under water. Wallace observes that the seal has the curious habit of sleeping for three minutes, and then waking for three minutes.

The voice of the seal is usually like that of a calf, but when angry it utters a growling bark. The eye is very peculiar, the pupil is neither round nor oblong, but four-rayed; the eye is very expressive, and the seal when wounded or alarmed sheds tears. In spite of the absence of an external ear, the sense of hearing is good, and the creature is very susceptible to music, listening with great complacency to the sound of bells. The seals will raise their heads above water and listen to the song of the sailors weighing the anchor; at Iboy in the Orkneys, the church stands on the shore, and when the bell rings for divine service, the seals are observed swimming shoreward straight to the spot whence the sound proceeds, and then listening with rapture as long as the bells are ringing out their summons to all good Christians.

They are easily tamed, learn their names, and come when called for, and it is said that some have been trained to fish. The females are devoted to their young, playing with them and defending them at all

risks; when hard pressed, they take their offspring in their fore-paws, press it to the breast, and fling themselves into the water; if flight is difficult, the mother never deserts her child, but remains to share its fate, whether it be captivity or death.

The food of the seal is almost exclusively fish, and they work sad havoc in salmon fisheries, as they occupy the mouths of the rivers and catch the ascending fish. In some regions, therefore, they are hunted as destroyers; in others, they are hunted as the most valuable of animals. The Greenlanders use every part of the seal, civilized men prize its water-proof skin and its oil. The seal-fishery is a mere slaughter, especially as carried on by the professional seal-fishers. Another enemy is the species of dolphin, *Orcinus orca*, which the Greenlanders call the "Seal's Master"; and the terror of this foe makes the seals lay aside all their fear of man, and they will come up on shore and crowd like dogs around the fishermen, as if hoping to find protection. The Polar Bear, too, is assiduous in capturing them.

The COMMON SEAL, *Callocephalus vitulinus* (Plate XXVI), is found on our northern and eastern shores, and is the common seal of Europe. It is not, however, very numerous south of Hudson's Bay; a small colony is said to have existed at Nahant, but usually only individuals are seen in our waters. It is probable, however, that they were once common in New York harbor, as the reef named Robbin's Reef derives its name from the Dutch word for seal, "Robbe."

This seal attains the length of five or six feet, and the female is larger than the male. The head is round, the eye large and with a sagacious expression, the ear marked only by a slight elevation, the neck short, the body tapering from the shoulders to the tail, the fore-feet short, the hind-feet broad. The hide is covered with stiff shining bristles over a thin undercoat, the color is gray, with brown and black spots.

It is found all through the North Atlantic, on the coasts of Spain, France, England, Scandinavia and Iceland, in the Baltic, in the Sound and Belt, as well as in the Gulf of Bothnia and Finland, in the Mediterranean Sea, in the White Sea, and on all our Northern Coast. It has been seen in the Gulf of Mexico, and even on the north coast of South America.

To the Esquimaux this seal is indispensable; his food consists of its flesh, his hut is lighted with its oil, its blood is formed into soup, its sinews are used for fishing-lines and in countless other ways, its finer

membranes are dried, and, as they are transparent, are used to cover the windows of the hut. Each seal furnishes about half a barrel of oil.

The CASPIAN SEAL, *Callicephalus Caspicus*, seems to be a mere straggler from the great army of Common Seals, and to possess no very characteristic marks, distinguishing it from its fellows.

II.—GENUS PAGOMYS.

This genus embraces *two* species, and is distinguished from the preceding genus by the greater depression of the skull.

The HOE-RAT, *Pagomys fatidus*, is the smallest of the northern seals, and obtains its specific title *fatidus* or “stinking” from the vile odor emitted by the old males.

III.—GENUS PAGOPHILUS.

The seals contained in the *two* species of this genus have a longer and narrower head than the common seal, a flatter forehead, a longer muzzle, a shorter hand, the second finger being the longest.

The HARP SEAL, or ATAK, *Pagophilus Greenlandicus* (Plate XXVI), may be taken as the representative of the genus. It is also called the Saddle-back Seal, and derives its name from its remarkable coloring. Its coat is a whitish-gray, on which two broad semicircular bands of deep black are drawn, extending from the shoulders to the tail; the muzzle and forepart of the head are also black. This marking is not conspicuous till the animal attains its fifth year.

The Harp Seal is generally about seven feet in length, and is found in great numbers on the coasts of Greenland, where it congregates in large herds. It prefers to take up its abode upon floating ice-islands. The oil it supplies is said to be purer than that from other seals, and it is furnished with an extraordinary amount of blubber. In its habits it resembles the Common Seal, and like it, it is easily tamed.

Two of these animals which were placed in the zoological collection at the Jardin des Plantes, were at their first arrival extremely shy, and would avoid the person of man with every mark of terror. Yet in a very short time they became quite tame, and would voluntarily seek the caresses of those who had behaved kindly toward them. They also

struck up a great friendship with two little dogs, and would allow their little playfellows to take all kinds of liberties with them, permitting the dogs to sit on their backs and bark, and not even resenting an occasional bite. They would even permit the dogs to take their food from their mouths; but if any of the seal-tribe attempted to act in like manner, a sharp combat immediately took place, the weaker being forced ultimately to succumb to superior might. In cold weather, dogs and seals were accustomed to huddle closely together for the sake of warmth, and when the dogs made their way out of the entrance, the seals did their best to follow their little playfellows, caring nothing for the rough ground over which they were forced to pass. This Seal stands in great dread of other species of Seal, such as the Sea Lion and Sea Bear, and according to many accounts holds the spermaceti whale in awe, being chased by that formidable creature into the shallow waters of the shore. Twice in the year the Harp Seal indulges in a migration similar to that of the Sea Leopard. The young of this species are sometimes two in number, although the maternal Seal is often forced to content herself with a single child.

IV.—GENUS HALICYON.

The *two* species mentioned by Gray are probably identical, and we may regard them as the sole representative of the genus.

RICHARD'S SEAL, *Halicyon Richardsii*, the best known species, is found on the Californian and Oregon coasts.

V.—GENUS PHOCA.

Of the *three* species of this genus we need mention only one.

The BEARDED SEAL, *Phoca barbata*, is so called from its long mustaches; from its size, it has also obtained the name of the Great Seal. It attains a length of about fifteen feet, is of a dark-brown color, with short stiff hair, and frequents lonely and sequestered places. The Esquimaux say its blubber has a very delicate taste, and its skin is used for their harpoon lines.

The other species are found in the North Pacific, and in Japanese waters.

Gray's sub-family HALICHERINA contains only *one* genus, of *one* species.

VI.—GENUS HALICHÆRUS.

The GRAY SEAL, *Halichærus gryphus*, is common on the Swedish and Scotch coasts. The muzzle is broad and rounded, the skull high in front, the nostril very large. In many respects it resembles anatomically the walrus, and like the latter, has a small brain, and consequently little intelligence.

The next sub-family is called by Gray MONACHINA, and the genus *Monachus*. We prefer Wallace's nomenclature.

VII.—GENUS PELAGIUS.

The ocean near the island of Madeira, and the Black and Mediterranean seas are the homes of the *two* species of this genus.

The WHITE-BELLIED SEAL, *Pelagius albiventer*, is found in the Mediterranean, especially on the borders of the Adriatic Sea. It varies in size from seven feet to over ten feet. It is one of the most intelligent of the family. M. Boitard says that he saw one which had been in captivity for two years, and which, let loose in ponds and even in large rivers, came to its master when called.

The sub-family STENORHYNCHINA contains *four* genera.

VIII.—GENUS STENORHYNCHUS.

The *solitary* species of the genus inhabits the Antarctic Ocean, extending northward to the Falkland Islands, New South Wales, and New Zealand. It is named by Gray the SEA LEOPARD, *Stenorhynchus leptonyx*; the hinder feet are nearly clawless, and resemble somewhat the tail-fin of a fish.

IX.—GENUS LOBODON.

This also is represented by *one* species.

The CRAB-EATING SEAL, *Lobodon carcinophoca*, has a pale-olive color on the head and back, and hind-feet; the fore-feet, sides of face, and belly are yellowish-white, and the whiskers white. Like the preceding genus, it is found in the Antarctic Seas.

X.—GENUS LEPTONYX.

THE FALSE SEA LEOPARD, or LEOPARD SEAL, *Leptonyx Weddellii*, the *only* species yet discovered, is distinguishable from the other Seals by means of its slender neck, and the wider gape of its mouth, which opens further backward than is generally the case. The body is rather curiously formed, being largest toward the middle, from whence it tapers rapidly to the short and inconspicuous tail.

The fore-paws are without any projecting membrane, and are largest at the thumb-joint, diminishing gradually to the last joint. The claws are sharp and curved, and rather deeply grooved; their color is black. The hind-feet are devoid of claws and projecting membrane, and bear some resemblance to the tail-fin of a fish. The color of this Seal is generally a pale gray, relieved with a number of pale grayish-white spots, which have earned for the animal the name of Leopard Seal. The external ears are wanting.

Very little is known of the habits of this Seal. Captain Weddell, who first noticed this species, speaks of it casually as a well-known animal, merely mentioning that his men caught so many Leopard Seals, or that they secured so many Seal skins and so many Leopard Seal skins in the course of their hunt.

It is not a very large animal, as the average length of the largest specimens is scarcely ten feet. Around the largest part of the body the circumference measures nearly six feet and a half, round the root of the tail about two feet three inches, and round the neck barely two feet. It was recorded by Captain Weddell to have been seen off the South Orkneys. Some specimens in the British Museum were taken off the eastern coast of Polynesia. As far as is yet known, these animals are only found in the Southern hemisphere.

XI.—GENUS OMMATOPHOCA.

This genus is distinguished by a short, broad muzzle, and very large orbits of the eyes. Its habitation is the Antarctic Ocean. It contains only *one* species.

ROSS'S LARGE-EYED SEAL, *Ommatophoca Rossii*, has a greenish-yellow fur, with oblique yellow stripes on the side.

Gray's last sub-family is that of the CYSTOPHORINA or Crested Seals, and comprises *two* genera.

XII.—GENUS MORUNGA.

The *two* species of this genus are found in California, the Falkland Islands, and in general the temperate regions of the Southern Ocean.

The SEA ELEPHANT, *Morunga elephantina* (Plate XXVI). This enormous animal, when fully grown, has a length of twenty-five feet, and a circumference of sixteen feet. It has a prominent proboscis, which, as well as its great size, justifies its name. When fully developed this feature attains in the male a length of about four feet. It has the power of drawing in or extending it at will. The color of the male is a dark grayish-blue or brown, and that of the female a dark olive-brown above, and a yellowish-brown below. It has four fingers and a short thumb on the fore-limbs, with perfect nails, but the hind-toes are nailless. The hair is rather coarse, but the thick skin was formerly in much request for harness. The blubber yields an odorless oil, which burns without smoke. Sea-elephants were formerly found in shoals in the Antarctic seas, but have been almost entirely exterminated. One of the Falkland Islands was called Elephant Island, from the number of these creatures that frequented it; but when Lecomte was there, he found the place deserted. Their food is chiefly cuttle-fish and sea-weed.

It is a migrating animal, moving southward as the summer comes on, and northward when the cold weather of the winter months would make its more southern retreats unendurable. Their first migration is generally made in the middle of June, when the females become mothers, and remain in charge of their nurseries for nearly two months. During this time the males are said to form a *cordon* between their mates and the sea, in order to prevent them from deserting their young charges. At the expiration of this time, the males relax their supervision, and the whole family luxuriates together in the sea, where the mothers soon regain their health and strength. They then seek the shore afresh, and occupy themselves in settling their matrimonial alliances, which are understood on the principle that the strongest shall make his choice among the opposite sex, and that the weakest may take those that are rejected by his conquerors, or none at all, as the case may be. None but the brave obtain the fair.



SEA BEAR

SEA LION
SEA ELEPHANT

PLATE XXVI. CARNIVORA

During the season of courtship the males fight desperately with each other, inflicting fearful wounds with their tusk-like teeth, while the females remain aloof, as quiet spectators of the combat. They are polygamous animals, each male being lord over a considerable number of females, whom he rules with despotic sway. When the victorious combatants have chosen their mates, they are very careful about their safety, and refuse to quit them if they should be in any danger. Knowing this fact, the seal-hunters always direct their attacks upon the females, being sure to capture the male afterward. If they were to kill the male at first, his harem would immediately disperse and fly in terror, but as long as he lives they will continue to crowd round him.

Although these animals are of so great dimensions and bodily strength, and are furnished with a very formidable set of teeth, they are not nearly such dangerous antagonists as the walrus, and are most apathetic in their habits. When roused, they never use their teeth, but waddle away toward the water, their huge bodies shaking like jelly. So plentifully are they supplied with blubber, that one male will furnish seventy gallons of oil.

The extraordinary proboscis is not very conspicuous till the animal is excited; then it protrudes it, blows violently through it, and has a most formidable appearance. The female is entirely destitute of this extraordinary and inexplicable appendage.

At present the Sea Elephant is found chiefly near the Crozet Islands and Kerguelen's Land, but it seems possible that in a few years it will be as extinct as the Mammoth.

XIII.—GENUS CYSTOPHORA.

The preceding genus has the nose developed into a trunk; this one has it provided with a hood. The head is broad, and the muzzle very short, and over the head stands a cartilaginous crest, six or seven inches in height, supporting a hood-like development of the septum of the nares, which is covered with short brown hair, and can be inflated at will. This extraordinary head-gear is peculiar to the adult male. The genus contains *two* species.

The CRESTED SEAL, *Cystophora cristata* (Plate XXVI) is found spread over the coasts of Southern Greenland, and is in the habit of reposing much upon ice-islands, caring comparatively little for ordinary land. It

also frequents the shores of Northern America. From September to March it is found in Davis' Straits, but leaves that locality for the purpose of producing and rearing its young, and returns again in June, together with its offspring, in a very bare and poor condition. About July it takes another excursion, and employs its time in recovering the health and strength which it had lost during the period of its former absence, so that in September it is very fat, and altogether in excellent condition for the fisher who values it for its oil.

The Crested Seal attains the size of ten to twelve feet when fully grown, and then it is of a dark blue-black color on the back, fading away to a yellowish-white below : a number of gray patches, each with a dark spot, are scattered over the body ; the head, tail, and feet are black. It is the lion of the Northern Seas, and shares with the walrus the empire of the Pole. The onset of an enraged Crested Seal is much to be dreaded, for the creature is marvellously fierce when its anger is roused, and its strength is very considerable. The teeth, too, are formidably powerful, and can inflict very dangerous wounds. In fighting, they can use their claws as well as their teeth. The males are always pugnacious animals, and during the season when they choose their mates are in the habit of fighting desperately among each other for the possession of some attractive female, and in these combats inflict severe lacerations. During these conflicts the two combatants express their mutual rage by emitting a torrent of loud, passionate, yelling screams, which are audible at a considerable distance. Various speculations have been made regarding the use of the crest, or rather, nasal bladder. It probably is useful by protecting that very vulnerable spot, the nose.

The WEST INDIAN CRESTED SEAL, *Cystophora Antillarum*, has a gray-brown color. In the Report of the U. S. Exploring Expedition to the Antarctic Seas, Dr. Pickering states that he saw one a hundred and thirty-five miles from land, swimming entirely by its pectoral fins.



ORDER V.

CETACEA.

Sub-Order—I.	{	36. BALÆNIDÆ.
MYSTACETI.		37. BALÆNOPTERIDÆ.

	{	38. CATODONTIDÆ.
Sub-Order—II.		39. HYPEROODONTIDÆ
ODONTOCETI.		40. MONODONTIDÆ.
		41. DELPHINIDÆ.

CETACEA

CHAPTER I.

THE RIGHT WHALES.

THE CETACEA—THE FAMILY BALÆNIDÆ—THE GREENLAND WHALE—ITS MODE OF RESPIRATION—ITS BLUBBER—WHALEBONE—THE YOUNG WHALE—ENEMIES OF THE WHALE—THE WHALE FISHERY—AMERICAN WHALERS—MODE OF HUNTING THE WHALE—THE HARPOON AND BOMB-LANCE—AUSTRALIAN RIGHT WHALE—SCRAG WHALE—BISCAY WHALE—GENUS EUBALÆNA—GENERA HUNTERIUS, CAPERIA, MACLEAYIUS.

THE order at which we have now arrived contains some of the largest animals of the world. In land animals, whose weight has to be supported by limbs, there is evidently a limit to their size; while aquatic animals, buoyed up by the dense medium of water on every side, and surrounded by an inexhaustible supply of food, attain to enormous dimensions.

The CETACEA are mammals deprived entirely of hinder limbs. The trunk of the body is prolonged into a thick tail terminated by a broad fin which resembles in its general shape that of a fish, but is entirely composed of an expansion of the skin, supported by a tough cartilaginous substance. This tail, instead of being placed vertically, is horizontal, thus enabling the animals to plunge into the depths of the ocean, and rise again to the surface. The head is joined to the body without any apparent neck, and the fore-limbs are so flattened and hidden in the skin that they may easily be mistaken for pectoral fins. Dissection, however, shows that they present, under a modified shape, bones and fingers corresponding to those met with in the lion and the bat. Constructed entirely for swimming, the Cetacea are strictly confined to the waters; nevertheless they breathe air by means of lungs, and are therefore perpetually compelled to come to the surface for the purpose of respiration. Their blood is hot; they bring forth living young which they feed with their own milk, and thus, in all details of their structure, differ from the cold-blooded, gill-breathing, oviparous fishes. As the Cetacea often dive

to considerable depths, where the pressure of water is enormous, they are provided with a covering of great elasticity. Their skin is thickened, and made up of a texture of interwoven fibres enclosing an immense quantity of oil or blubber, which is admirably adapted to resist compression. This thick integument of fat retains the animal heat, and thus enables the Cetaceans to inhabit the coldest regions of the ocean, and as oil is lighter than water, it contributes greatly to the buoyancy of these unwieldy animals. A dead whale floats, but the carcass, when stripped of blubber, sinks immediately.

The order CETACEA is divided into two sub-orders; MYSTACETI, or true whales, which have the mouth provided with baleen or whalebone, and ODONTOCETI, sperm-whales, blackfish, porpoises, and the like, which have teeth in one or both jaws. The first sub-order contains *two* families, the second, *four*.

THE RIGHT WHALES.

The family BALÆNIDÆ is divided into *six* genera and *fourteen* species, but most of the latter are imperfectly known, and their classification is by no means settled; it comprises the "right" whales, of which the Greenland whale is the most important.

GENUS BALÆNA.

Into this genus *three* species are admitted without controversy; but a fourth, the so-called "Scrag Whale of Dudley," has been the subject of great doubt, as it is not known to whalers now-a-days, and is supposed by Cuvier to be a mutilated Rorqual.

The GREENLAND or RIGHT WHALE, *Balæna Mystacetus* (Plate XXVII), inhabits the Northern seas, and when full-grown, attains a length of sixty to seventy feet, with about thirty to forty feet in girth. Its color is velvety black upon the upper part of the body, gray at the junction of the tail and at the base of the fins, and white on the abdomen. The head is remarkably large, being about one-third of the length of the entire bulk. The jaws open very far back, and average sixteen feet in length, seven feet wide, and ten or twelve feet in height, affording space for a jolly-boat and her crew to float in. The tail is enormously powerful, enabling the largest whales, measuring eighty feet in length, to leap

clear out of the water, like a trout after a fly. This movement is technically called "breaching," and the splash of the creature as it falls back into the water may be heard for miles. The length of the tail in the larger whales is about five or six feet, but it is often more than twenty feet in breadth. The skin of the whale is devoid of hair, and is of very peculiar structure. The true skin constitutes the blubber, which is never less than two inches in depth, and in some places is nearly two feet thick; it is as elastic as caoutchouc, and in a large specimen will weigh thirty tons.

The whales are compelled to rise to the surface to breathe; their respirations are technically called "spoutings," because a column of vapor is ejected from the "blow-holes" or nostrils, and spouts up to the height of about twenty feet. These blow-holes are on the upper part of the head, so that very little of the carcass need be exposed during the operation; in fact, only the upper portion of the head and part of the back are visible. The "spoutings" can be heard for a considerable distance, and indicate to the fisher the presence of their victim. These "spoutings" at intervals would not be of any avail to oxygenize the blood unless the organs of respiration had been modified to meet the peculiar circumstances in which the whales are placed: the whales therefore are furnished with a large reservoir of arterial blood, which is contained in a mass of vessels lining the interior of the chest and the adjacent parts, and which are capable of holding a sufficient quantity of fresh blood to support life for a considerable period.

The spout is not formed of any liquid water; it is composed at one and the same time of hot air issuing from the chest, of a certain quantity of vapor of water, mixed with this air, and of greasy particles. So, when the temperature is rather high, the sea calm, and, above all, when the sun is near the zenith, this blowing, or spouting, is invisible. When the vapor from this blow-spout is disseminated into the air, it dissolves—all disappears; there falls nothing but a few little drops of greasy matter. These drops, diffused over the surface of the water, and joined to the exhalations of the skin, leave on the surface of the sea long trails of oily spots, which show the way by which the whale has passed. Of course there is always a certain quantity of water, which has penetrated into the aërial canal terminated by the blow-hole, and this water is mixed in a state of minute subdivision or particles, with the respired air, and disseminates itself in the atmosphere, like the pulmonary moisture.

The whales descend to depths so profound, that if a piece of dry wood be sunk to an equal depth, it will become saturated, and cease to float; their ears and nostrils require special adaptations to prevent the water from penetrating into these cavities; they are consequently provided with an ingenious valvular structure which closes the external orifices in proportion to the depth to which the animal dives.

The substance called "whalebone" is a very remarkable feature in the jaws of the Right Whales. This whalebone, or baleen, is found in a series of plates, thick and solid at the insertion into the jaw, and splitting at the extremity into a multitude of hair-like fringes. On each side of the jaw there are more than three hundred of these plates. The weight of baleen which is furnished by a large whale is about one ton. This substance does not take its origin directly from the gum, but from a peculiar vascular formation which rests upon it. These masses of baleen are placed along the sides of the mouth for the purpose of aiding the whale in procuring its food and separating it from the water.

The mode of feeding which is adopted by the whale is as follows: The animal frequents those parts of the ocean which are the best supplied with the various creatures on which it feeds, and which are all of very small size, as is needful from the size of its gullet, which is not quite two inches in diameter. Small shrimps, crabs, and lobsters, together with various molluscs and medusæ, form the diet on which the vast bulk of the Greenland Whale is sustained. Driving with open mouth through the congregated shoals of these little creatures, the whale engulphs them by millions in its enormous jaws, and continues its destructive course until it has sufficiently charged its mouth with prey. Closing its jaws and driving out through the interstices of the whalebone the water which it has taken together with its prey, it retains the captured animals which are entangled in the whalebone, and swallows them at its ease. The multitude of these little creatures that must hourly perish is so enormous, that the prolific powers of nature would seem inadequate to keep up a supply of food for the herds of whales that inhabit the Northern seas. Yet the supply is more than equal to the demand, for the sea is absolutely reddened for miles by the countless millions of medusæ that swarm in its waters.

The enormous mouth contains an immense tongue, which sometimes measures as much as twenty-five feet in length and twelve feet in breadth. This organ is very soft, and produces five to six barrels of oil.

The eye is placed immediately above the junction of the lips, very near the shoulder, and thus either eye can see only the objects on its own side; it is very small, and often difficult to discover; the eyelids are destitute of lashes, and so swollen by the grease which occupies their interior, that they are almost incapable of being moved. The structure of the eye is admirably adapted for aquatic media.

The Greenland Whale, as its name indicates, inhabits the Arctic seas without having, however, any fixed dwelling-place. Its coming and going depends on the state of the ice, and it immediately leaves a neighborhood when the ice is melted. According to some observers, the old whales never come south of 65° north latitude, nor the younger ones south of 64° . Between the 66° and 69° both young and old are seen regularly in December and January. In March, numbers are seen in the bays and near the islands of the coast of Greenland, but after that month they retire to the north, and in summer may be found in the latitude of 71° to 75° north, resuming their journey to the south in the end of September.

According to the observations of Scoresby and Brown, the whales pair about June or July, and bring forth their young (never more than one at a birth) in ten months. No one has yet seen how the little one is taught to suck. Other marine mammals are either born on land, or if born in the water, as is the case with the Sirenia, are clasped by the mother to her breast and raised above the surface. The whales, from their bodily structure, must, from the first moment of their lives, perform the same motions as the parent. Scammon states that the mother reclines on one side on the surface of the water in order to give suck. The young whale sucks for nearly a year, during which time the mother displays the utmost affection and solicitude, exposing herself to all dangers, and never leaving it as long as she is alive.

The movements of the whale are by no means so slow as we might imagine, if we regarded only the unwieldy shape of the carcass. A whale wounded at Scoresby Sound on the east coast of Greenland, was found dead next day on the west coast at Omenak; it must therefore have swum round Cape Farewell, and traversed a distance of nearly three hundred miles. Considerable difference of opinion exists as to the length of time the whale can remain under water. Under ordinary circumstances it seldom exceeds half an hour, although one instance is

recorded where a wounded old whale remained an hour and twenty minutes without rising. When it did appear, it was terribly exhausted.

The whale possesses numerous enemies, the chief being the Gladiator Dolphin, the most savage of all Cetacea. The Thresher and Greenland Shark do not attack it while alive. A very circumstantial account, given by many writers, of a combat between the sword-fish and the whale, originated in a misconception, the name sword-fish being applied by many sailors to the above-mentioned Gladiator Dolphin. Each kind of whale has its own peculiar kind of parasite, one has the *Coronula*, another the *Diadema*, a third the *Tubicinilla*. They are all sunk beneath the surface of the skin, with the aperture for the free valve exposed, and as they grow in size, they sink deeper into the skin. Birds have often been observed alighting on the backs of whales for the purpose of picking up these cirripeds, but the operation does not seem to be acceptable to the marine monster, which usually dives with the utmost speed when it feels the first dig of the bird's beak.

The whale is an animal of great importance to civilized and to savage men. The oil which is procured in great quantities from its blubber and other portions of its structure is almost invaluable to us, while the bones and baleen find their use in every civilized land. To the natives of the polar regions, however, the whale is of still greater value, as they procure many necessities of life from various parts of its body, eat the flesh, and drink the oil. Repulsive as such a diet may appear to us who live in a warm region, it is an absolute necessity in these ice-bound lands, such oleaginous diet being needful in order to keep up the heat of the body by a bountiful supply of carbon. But the best part of the whale is one that would hardly be expected to form an article of diet, namely the portion of the gums in which the roots of the baleen are still imbedded. The Tuskis call this substance their sugar, though its flavor is very like that of cream-cheese. One traveler who had been obliged, through motives of politeness, to take part in a native banquet, and who had been more than disgusted by the very remarkable dishes which were brought to table, became quite enthusiastic on the merits of whale's skin and gum, acknowledging himself to be agreeably surprised by the former, and calling the latter article of diet "perfectly delicious." On the shores of the Polar Sea whalebone is used for building purposes, and the dwellings thus constructed are described as better and more solid than most of the Siberian huts on that bleak coast.



PORPOISE

DOLPHIN

RIGHT WHALE
BLACK FISH

PLATE XXVII CETACEA

THE WHALE FISHERY.

The chase of the whale has been long practised, and has furnished material for countless stories of adventures. The figure copied from "Scoresby's Account of the Arctic Regions" of a whale tossing a boat and its crew far into the air is an artistic exaggeration; at the utmost, a whale has been known to toss a boat nearly three feet into the air. The occupation has enough of excitement and danger to dispense with any imaginary feats. The Basques are the people to whom belongs the honor of first fitting vessels for hunting the whale. Like other nations, these bold sailors at first contented themselves with attacking the rorquals that visited their native coasts, but as early as 1372 they ventured into the Northern seas. But the civil war of 1633 which ended in a success for the Spaniards, destroyed the whale-fishing enterprise of the Basques, many of whom left their country, and took with them a knowledge of the art. Hull, in England, sent out a whaling-ship in 1598, and the merchants of Amsterdam formed a company in 1611 to prosecute the fishing near Spitzbergen. The business speedily developed. Between 1676 and 1722 the Dutch had sent out 5,886 ships from their harbors, and captured 32,907 whales. In 1732 England offered a bounty to whalers, and even doubled the amount in 1749: the result was that soon afterward she had over two hundred ships engaged in the pursuit. At present the Americans are the most active. Scammon states that between 1835 and 1872 nearly 20,000 vessels had been occupied in the trade, and brought back a little over three and a half million barrels of spermaceti, and six and a half million barrels of train oil; worth, altogether, two hundred and seventy-two millions of dollars. This statement leads to the conclusion that 3,865 sperm whales, and 2,875 right whales were killed annually. The year 1854 shows the largest figures, 668 ships, 73,696 barrels sperm, and 319,837 barrels train oil: while, in 1872, the numbers had fallen to 218 ships, 44,880 barrels sperm, and 31,395 barrels train oil, and in 1876, to 169 ships of all sizes.

Whale-fishing is not only a very dangerous and laborious pursuit, but it is also exceedingly precarious. Sometimes a complete cargo of oil and whalebone is taken in a short time, but it also happens that after a long cruise not a single whale is caught.

The Greenland whale-fishery was at first confined to the seas between Spitzbergen and Greenland, but at present the whalers seek the higher

latitudes of Baffin's Bay, sometimes entering Lancaster Sound and Barrow's Straits.

The ships leave their harbors for the Arctic fishing-grounds in spring, and when they reach the fishing-grounds, either cruise to and fro, or lie at anchor in a favorable spot. Men are placed at the mast-head to look out. The cry, "There she blows," brings all the crew on deck, the boats are at once manned with six or eight rowers, a helmsman and a harpooner, and row with all speed toward the unsuspecting whale. The harpoon is a long, lance-like weapon, provided with a strong barb, and made fast to a very long, very flexible rope which is rolled on a reel with the utmost care, as any kink in it as it runs out would imperil the boat. The boat approaches as near the whale as possible, the harpooner rises and poises his weapon. He flings it with all his strength, and the rowers immediately back-water to get away from the wounded animal. Usually it dives at once, and with such speed that the line runs from the reel with such violence that it has to be kept cool by pouring water over it. It often, indeed, happens that the boat is dragged for hours by the wounded creature in its headlong flight. The whale appears at the surface in about a quarter of an hour, in order to breathe; the boat from which it has been struck and other boats from the ship approach, a second weapon is plunged into the body. The fish rolls from side to side, leaps out of the water, dives furiously, leaving a whirlpool behind it; rises once more, only to meet a new lance. Blood is driven out from the blow-holes, and the sea is dyed red; a vain expenditure of strength makes the ocean boil, then comes a final quiver, and the whale sinks on one side, a plaything for the waves; while, in the Southern seas, thousands of birds, chiefly petrels and albatrosses, are flying around waiting to make a meal of the dead monster.

When the whale is dead, it is made fast alongside of the ship, belly upward, its tail forward, and its nose level with the stern of the vessel. It is not without great difficulty that this enormous mass, which just now traversed the sea with such facility, can be towed so as to be landed on the shore.

In olden times the fishermen of the north of Europe used to cut up the whale by going upon its carcass, provided with boots furnished with cramp-irons. They thus stripped off bands of blubber along the whole length of the animal, from head to tail. But this way of cutting up the whale was long, difficult, and even dangerous.

The whalers in the Southern Ocean have a better way of proceeding: this consists in cutting out, along the whole length of the animal's body, a broad continuous band shaped like a screw, beginning at the head and only finishing at the tail, very nearly in the same way in which children proceed when they are taking off the peel of an orange.

The head is drawn up by pullies, and they then detach, by means of sharp spades, one side of the under-lip, and take it away; they then detach the tongue, which weighs many thousands of pounds; then the other half of the lip; next the upper jaw, with its whalebone-plates, which are becoming more and more sought after in commerce every day. Then they begin to cut a thick band of grease and skin, which they keep on detaching, hauling up on board, and stowing away. It is thus that they unwind, as we may say, the whale, making its body turn round on itself. The blubber is then melted; a single Right Whale will yield twenty tons of oil.

The harpoon, however, has been superseded by the *bomb-lance*. This weapon contains about one hundred grains of powder, and can be thrown by a heavy gun a distance of over twenty fathoms. When the gun is fired, the projectile penetrates into the fleshy parts of the animal, the fuse which had been kindled by the explosion of the gun, sets fire to the powder in the bomb, the bomb explodes and throws out barbs. If the explosion of the charge takes place in the lung, death is nearly always instantaneous.

The Greenland fishers estimate the size of the fish by the size of the whalebone, and when this is six feet long, the whale is called a size-fish. The flakes of whalebone are from ten to fourteen feet in length in full-grown specimens, the breadth of the largest at the thick end is about a foot. As regards the color of the whalebone, it is variable. In the young, the laminae are frequently striped green and black, but on the old animal they are occasionally altogether black; often some of the laminae are striped with alternate streaks of black and white, whilst others want this variegation. Whalebone is said to be occasionally found white, without the animal differing in the slightest degree; and, accordingly, this character loses its supposed importance as being a peculiarity of the exceedingly dubious Scrag Whale indicated by Dudley. With regard to the nature of whalebone Dr. Gray writes: "The baleen has generally been considered as the teeth of the whale, but this is a mistake. The teeth in the *balaena* never cut the gum, but are reabsorbed, while the

integumentary system furnishes the baleen, which is evidently a modified form of hair and cuticle."

We need not do more than mention the other species of the genus, as they do not differ in any important particular from the Greenland Whale, which we have just described.

The WESTERN AUSTRALIAN RIGHT WHALE, *Balæna marginata*, is remarkable for the length and slenderness of its whalebone, and is undoubtedly a very distinct species.

The SCRAG WHALE, *Balæna gibbosa*, we have already mentioned. Its describer Dudley writes in the year 1725, "Nearly akin to the Fin-back, but instead of a fin upon its back, the ridge of the after-part of its back is scragged with half-a-dozen knobs or knuckles. He is nearest the Right Whale (*B. mysticetus*) in figure and quantity of oil. His bone (whalebone) is white, but will not split." Mr. Brown says, "What whale this is, I cannot imagine."

The BISCAY WHALE, *Balæna Biscayensis*, is the name given by Dr. Eschricht to a second species of Right Whale found in the Greenland seas, which is much smaller and more active than the *Balæna mysticetus*, and which belongs to the temperate North Atlantic.

GENUS EUBALÆNA.

The CAPE WHALE, *Eubalæna Australis*, is the only species that can be certainly referred to this genus; a female measuring sixty-eight feet in length has been caught, and we may remark that in the Greenland Right Whale, and probably in all other *Balenidæ*, the female is the larger. The Japanese Whale (*E. Sieboldii* of Gray), according to that naturalist, "is only described and figured from a model made in porcelain clay by a Japanese under the inspection of a Japanese whaler and of Dr. Siebold; but no remains of the animal were brought to Europe; so that we do not know whether it is a *Eubalæna* or a *Hunterius*, or if it may not be an entirely new form." Mr. Bennett observes that "the Right Whale, so abundant and so little molested in the northernmost waters of the Pacific, especially off the north-west coast of America, is probably identical with the Greenland species;" but Dr. Gray remarks that its baleen, which is very inferior in quality to that of *B. mysticetus*, "shows that it is more allied to the Cape species, but apparently distinct from it."

GENERA HUNTERIUS, CAPERIA, MACLEAYIUS.

These three Southern genera are only beginning to be understood. In one or more of them a curious horny substance is commonly observed upon the fore-part of the head, which the whalers denominate the creature's "bonnet." One in the British Museum, obtained at the Sandwich Islands, is oblong in shape, eleven inches long and eight inches wide, with a very rough, pitted surface. The whole substance seems to be formed of irregular horny layers placed one over the other, the lowest layer being the last one formed; and each of these layers is more or less crumpled and plicated on the surface, giving the irregular appearance to the mass. "I do not recollect observing any account of this 'bonnet,'" writes Dr. Gray, "or giant corn, or rudimentary frontal horn, as it may be regarded, in any account of the Right Whale, nor in that of the Cachalot. I have especially searched for it in works by persons who have seen these whales alive, but without success. It has been suggested by Mr. Holdsworth, that the 'bonnet' may be a natural development, and possibly characteristic of the species bearing it."

Our knowledge of the Cetaceans is still very incomplete: they dwell in the most inaccessible parts of the ocean, and the swiftness of their movements rarely allows more than a transient view of their external form. Doubtless many species are still unknown, and doubtless, too, one and the same species has often been described under different names.



CHAPTER II.

THE FINNER WHALES AND RORQUALS.

THE HUMPBACK OR BUNCHED WHALES—THE RORQUALS OR BIG FINNERS—DIFFICULTY OF TAKING THEM—THE NORTHERN FINNER—THE SULPHUR-BOTTOM—ADVENTURE OF THE SHIP "PLYMOUTH"—THE GREAT INDIAN RORQUAL—ANCIENT ACCOUNTS OF IT—THE PIKE WHALE—THE SOUTHERN RORQUAL—THE CALIFORNIA GRAY WHALE.

THE second family, BALÆNOPTERIDÆ, comprises the Finner Whales and Rorquals, which are characterized by possessing a dorsal fin, and by having the baleen, or whalebone, less developed. The head is moderate in size, the body elongate, the belly usually marked with longitudinal plaits. They are abundant in all the Northern seas, occasionally found in the Tropical seas, and reappear in the Southern hemisphere in less numbers than in the Northern. The family is divided into *nine* genera, containing *twenty-two* species. We describe the most typical.

GENUS MEGAPTERA.

The animals of this genus are distinguished by having the flippers elongated, and the dorsal fin placed very low, the flippers attaining to one-fifth, or even one-fourth of the total length of the animal. From this extraordinary development the genus derives its name MEGAPTERA, from the Greek words *megas* "great" and *pteron* a "wing or fin." When the integument is removed these flippers are seen to be provided with only four fingers. The whalebone is of little value, being short, not splitting kindly, and becoming twisted when dry.

THE HUMPBACK WHALE.

The HUMPBACK OR BUNCHED WHALE, *Megaptera longimana*, may be taken as the representative of the genus. It is found in all parts of

the ocean, and attains a length of sixty to eighty feet, with fins measuring from twelve to twenty feet. The body is thick and clumsy, the front part, especially on the lower surface—for the peculiarity is not so noticeable on the back—being extraordinarily protuberant, the hinder part at the tail being remarkably contracted. The under jaw is longer and broader than the upper. On the last quarter of the body is found, with various modifications and developments, a mass of blubber forming a hump, a foot or so in height, and about the size of a man's head. From the under-jaw there run along the throat and breast as far as the pectoral fin. broad folds varying in number from eighteen to twenty-six, which are supposed to enable the creature to dilate its maw at pleasure. The skin is smooth, and is usually of a more or less uniform black on the back, while the under surface of the body and the pectoral fins are of a whitish color: some specimens are simply black above and white below, others all black, others black above, white below, with the pectoral and tail fins of a dark ash-gray hue.

The Humpback or Bunched Whale is very common, and seems to migrate annually from the Poles to the South, coming southward about September, and returning to the Arctic seas in spring. Off the coast of Upper California they are seen rarely between April and December, but on the coast of Greenland they are found only in summer. On the west coast of America they are seen all the year, but not every month at the same places. The movements of this whale are very irregular; it seldom swims any great distance in one direction; it stops here and there for longer or shorter intervals, and changes its course. At times the Humpbacks appear in numerous companies which cover the sea as far as the eye can reach, at other times they appear solitary, yet in this latter case they indulge in all the play, and all the attitudes of the tribe, as if they were surrounded by hundreds of their fellows. Even when swimming under water, they rock themselves from side to side. When they breathe, they blow in quick succession six to twenty times, sending up spouts of various degrees of strength from six to eighteen feet in height. Their food consists exclusively of small fishes and molluscs.

The Humpwhales are almost entirely neglected by the fishers, as their blubber furnishes much less oil than the Greenland or Sperm Whales. Of like quantities of blubber taken from Humpback and Greenland Whales respectively, the former will give eighteen, the latter sixty barrels of oil. Hence they are never chased when anything better can

be procured. Since our acquisition of Alaska, the capture of this species of whale has been carried on, while the older hunting-grounds, the Bays of Monterey, Magdalena, and Balenas are neglected.

The AMERICAN HUMPBAC, *Megaptera Americana*, is found in the neighborhood of Bermuda, and attains a length of fifty to sixty feet.

GENUS PHYSALUS.

The general characteristics of this genus—which contains *four* species—are as follows; the head forms one-fourth of the total length, the dorsal fin rises in the last quarter of the body, the pectoral fins close behind the head; the tail is deeply cut in the middle, forming two more or less clearly divided flaps.

THE RORQUAL.

The RORQUAL, *Physalus antiquorum* (Plate XXVIII), is called also the "Gibbar," the "Razorback," or the "Big Finner." It is the most slender of all cetaceans, and the longest of all known animals, measuring in some cases upwards of one hundred feet. The pectoral fins possess a length of one-tenth of the creature's length, and a breadth of one-fifteenth. The body attains its greatest thickness just behind the pectoral fins, but towards the tail becomes so compressed that its vertical section is considerably greater than its horizontal diameter. With the exception of a few hairs, or rather of some horny filaments split at the extremity into very fine threads, which are found on the upper jaw, the body is perfectly smooth, of a black color above, and pure white below. The deep furrows which run from the lower jaw down to the navel, are of a bluish-black. These furrows resemble cuts made with a knife. The toothless jaws bear three hundred to three hundred and fifty plates of baleen on each side, but this substance is short, coarse, and valueless for ordinary manufacturing purposes.

The Rorqual frequents the northern portions of the Atlantic Ocean and the Arctic seas, and is especially abundant near Barendt's Island, Nova Zembla, and Spitzbergen. When autumn begins, the Rorquals migrate to southern waters, and are found during the winter in the seas of the Temperate and Torrid Zones.



NARWHAL

WHITE WHALE

RORQUAL

PLATE XXVIII CETACEA

As befits its slender figure, the Rorqual is a swift and active animal, and when going at full speed, can pass a steamship. Its course is right ahead, and it rises on an average every ninety seconds to breathe. Less timid than other members of the family, it often appears near sailing ships, swimming round them or following them for hours; it displays extraordinary courage, and when provoked is the most mischievous of all whales: it possesses social instincts, and in case of danger seeks with all its power to defend its fellows.

It requires more nourishing food than the Right Whale, and has a much larger gullet. In the stomach of a single Rorqual six hundred codfish have been found, as well as a quantity of pilchards. It is in pursuit of the shoals of these fishes that the Rorqual proceeds southward, hovering around the fishing-ground and swallowing whole boat-loads of herrings and pilchards. It eats also immense quantities of sea-weed, and is said by observant fishermen to leave a neighborhood when the sea-weed is all consumed.

The Rorqual being almost valueless for commercial purposes, is seldom attacked by whale-fishers, and it is so active and fearless that the aggressors have often to repent their temerity. On one such occasion the Rorqual when harpooned started off in a direct line, and at such a rate that the men in the boat lost their presence of mind, and forgot to cut the rope. The whale made straight for a neighboring ice-field, shot beneath it, and dragged the boat and its crew beneath the ice. Scoresby endeavored to secure some Rorquals by using short lines with a buoy at the end, hoping the resistance offered by the buoy would tire out the whale. Two Rorquals were struck; the first dived with such speed and force that the line snapped away from the buoy; the second got loose by the rope being cut by the dorsal fin. A third that was harpooned by mistake, carried out three thousand feet of line in about a minute, and escaped by snapping the rope.

While neglected by the regular whalers, the Rorqual is eagerly chased by the inhabitants of the coasts which it visits. The chase is dangerous, not merely from the strength of the animal attacked, but from the fact that the other whales in the vicinity come to assist their comrade in his hour of need.

The Laplanders, who find the bones and other portions of this animal to be of great service to them, unite in its chase, and employ a very simple mode of action. To harpoon such a being would be useless, so

they content themselves with inflicting as many wounds as possible, and leaving it to die. After the lapse of a few days the huge carcass is generally found dead upon the strand, and becomes the property of all those who have wounded it and can prove their claims by the weapons which are found in its body. The person who finds the stranded carcass is by law entitled to one-third of the value.

The NORTHERN FINNER WHALE, *Physalus Gibbaldii*, has been taken by Gray as the representative of a separate genus which he calls *Gibbaldius*. It attains a length of one hundred feet, and has pectoral fins twelve feet in length. Little is known about this species, as it is usually confounded with the Rorqual.

THE SULPHUR-BOTTOM FINNER.

The SULPHUR-BOTTOM WHALE, *Physalus sulphureus*, is found on our North-west Coast. It is, perhaps, the largest of the whales frequenting the Pacific Ocean. It is found on the coast of California at all times of the year, but appears from May to September in numerous bands which approach the coast fearlessly, and swim round ships at anchor, or accompany them on their voyage. In the year 1850 the ship "Plymouth," passed through a school of these whales. One of them left its companions and followed the ship for twenty-four days. The crew, not admiring this dangerous companion, tried all means to get rid of it. As whales have a great horror of bilge-water, they set their pumps to work, but in vain. They pelted the whale with bottles, pieces of spars, and other missiles, and fired ball after ball into it. But the Sulphur-bottom paid no heed to their attentions, and kept close to the ship, occupying exactly the same position with regard to the vessel, whether she was sailing free before the wind, tossing about in a gale, or lying becalmed. At the end of November, the "Plymouth" met the bark "Kirkwood;" as the ships approached to each other within speaking distance, the whale left the "Plymouth" and took its station at the "Kirkwood," but when they parted, it returned to its old ship. The sailors gradually grew accustomed to the creature's presence, and called it "Blowhard," affirming that it knew its name, and would come nearer when summoned by this appellation. The Sulphur-bottom seemed to be anxious when the "Plymouth" drew near the coast, and finally left the ship when she came into soundings.

THE INDIAN RORQUAL.

The GREAT INDIAN RORQUAL, *Physalus Indicus*, was seen by Nearchus, who commanded the Indian fleet of Alexander the Great, B. C. 327.

Arrian informs us that when, in the morning, Nearchus was off Kyiza or Guttar, his people were surprised by observing the sea thrown up to a great height in the air, as if it were carried up by a whirlwind. The people were alarmed, and inquired of their pilot what might be the cause of the phenomenon; he informed them that it proceeded from the blowing of the whale, and that it was the practice of the creature as he sported in the sea. His report by no means quieted their alarm; they stopped rowing from astonishment, and the oars fell from their hands. Nearchus encouraged them, and recalled them to their duty, ordering the heads of the vessels to be pointed at the several creatures as they approached, and to attack them as they would the vessels of an enemy in battle: the fleet immediately formed as if going to engage, and advanced by a signal given; when, shouting altogether, and dashing the water with their oars, with the trumpets sounding at the same time, they had the satisfaction to see the enemy give way; for upon the approach of the vessels, the monsters ahead sunk before them, and rose again astern, where they continued their blowing without exciting any further alarm. All the credit of the victory fell to the share of Nearchus, and the acclamations of the people expressed their acknowledgment, both to his judgment and fortitude, employed in their unexpected delivery.

The great Indian Rorqual is, indeed, very common still in the seas where it was observed by Nearchus and his companions, off the coasts of Arabia and of Mekran, Sindh, the peninsula of Cutch, and again further southward, off the Malabar coast. One cast up dead upon Amherst Islet, near Ramri Island, on the Arakan coast, in the Bay of Bengal, during the rainy season of 1851, measured eighty-four feet in length, of which the rami of the lower jaw were twenty-one feet, or exactly one quarter of the total length. Another, stated to be ninety feet long, and about forty-two feet in circumference, was cast upon the Chittagong coast in 1842, in about lat. 21° N. It appears that early on the 15th August, the attention of the inhabitants of that coast were attracted by something in appearance like the capsized hull of a large vessel, floating on the surface of the sea, and coming towards the mouth of the Muskal

River. When it approached near the land, they perceived that it was a living creature, by its continually spouting up water into the air, and by the middle of the day it cast itself on the shore of Muskal Island. By the assistance of the flood and the surf of the sea, it was brought completely on shore, where, as soon as it was landed, it appeared to be in great distress, for it roared very loudly, like an elephant.

GENUS BALÆNOPTERA.

This genus, to which Gray allows only *two* species, comprises the smallest and most gracefully built creatures of the whole family. They possess moderately long pectoral fins, and a sickle-shaped dorsal fin on the latter third of the body.

THE PIKE WHALES.

The PIKE WHALE, *Balænoptera rostrata*, is the best known species of this genus. It seldom exceeds thirty feet in length, and is more commonly about twenty-five. It is furnished with balcen, but the plates are comparatively short, and of a slight pinkish hue. The mouth is developed into a kind of huge pouch, which is capable of containing a very large volume of water and marine animals. The tongue is not tied down as in the Greenland Whale, but is free toward the apex, and almost as capable of movement as that of man. The Pike Whale is a native of the seas that wash the coasts of Greenland, and is sometimes seen near Iceland and Norway, descending but rarely into warmer latitudes. The flesh of this animal is in some repute for its delicacy, and is therefore much coveted by the natives of these northern regions. They do not, however, attempt to harpoon the creature, on account of its great activity, but content themselves with inflicting severe wounds with their darts and spears, in the hope that the wounded animal may die, and may in time be stranded on their coasts. The oil which it furnishes is said to be particularly delicate.

The Pike Whale feeds not only on the little creatures that form the food of the Greenland Whale, but chases and kills the active salmon and other fish. In the stomach of one of these animals have been found the remains of various fish, those of the dog-fish being the most prevalent.

The head of this species is elongated and rather flattened, and the throat and chest are furnished with very deep longitudinal folds, which are capable of dilatation to a great extent.

At the extremity of the snout there are eight distinct bristles, arranged in perpendicular rows on the top of each jaw. It has been called by a great number of names by different writers, and is mentioned by various authors under no less than seventeen distinct titles. The color of this animal is black upon the upper parts of the body, and white on the abdomen, tinged with a reddish hue. The pectoral fin is almost entirely dark, but changes into white on its upper surface, near its base.

On the American coasts the Pike Whale is never made a regular object of pursuit. It is often, however, attacked when it comes near the coast; all the fishing-boats of the neighborhood put out to sea, surround the bewildered animal and drive it into shallow water, where it can be dispatched at leisure.

The SOUTHERN RORQUAL, *Balænoptera Australis*, has a long dorsal fin placed not far backward as usual, but just over the flippers. It is sometimes seen at the Cape of Good Hope, but is never pursued.

THE CALIFORNIA GRAY WHALE.

The classification of all these cetaceans is still very unsettled. Captain Scammon remarks: "We have experienced the greatest difficulty in finding any two of these strange animals alike, or possessing any marked generic or specific differences. If the differences pointed out as constituting different species are maintained, we conclude there must be a great number." One of the sufferers by modern systems of classification is the CALIFORNIA GRAY WHALE, for which Professor Cope has formed a separate genus, *Rhachianectis*. This species differs from the Southern Rorqual by the color of its baleen, and the number of its vertebræ, and from the Right Whale by its short head. It has no dorsal fin.



CHAPTER III.

THE SPERM WHALES AND BLACK FISH.

THE FAMILY CATODONTIDÆ—THE SPERM WHALES—SPERMACETI—THEIR SPEED—THEIR FURY WHEN PROVOKED—THE STORY OF THE SHIP "ESSEX"—OTHER SHIPS DESTROYED BY THIS WHALE—AMBERGRIS—SPECULATIONS AS TO ITS ORIGIN—FOOD OF THE SPERM WHALE—BLACK FISH—THE GENUS COGIA.

THE family CATODONTIDÆ, comprising the Cachalots or Sperm whales and the Black-fish, are distinguished from the true whales by having teeth in the lower jaw, and by being destitute of whalebone. While the two preceding families are dwellers in the Arctic and Antarctic regions, the toothed whales prefer the Tropical seas. The general characteristics of the family are as follows: The head is very large, and truncated in front; the blow-holes are separate, and situated in the front of the head; the pectoral fins are short and broad; in the upper jaw the teeth are only rudimentary. The numerous teeth in the lower jaw fit into holes in the gums of the upper. The family comprises *four* genera.

GENUS CATODON.

The skull of the animals of this genus occupies nearly one-third of the entire length of the body. Gray assigns to it *two* species, but experienced fishermen affirm that there is only *one* species, which is profoundly modified in form and size by location and abundance of food.

THE SPERM WHALES.

The SPERM WHALE, *Catodon macrocephalus* (Plate XXIX) is called "Cachalot" by the French, and "Pottfish" by the Dutch, and attains a considerable size. An adult male measures from sixty to seventy feet in length, a female about thirty to forty feet. The long, abruptly trun-

cated nead is as thick as the body, and passes into it without any external marks of separation. The pectoral fins are close behind the eye, and are marked on the upper surface by folds which indicate the five fingers; the tail is deeply indented. The blow-hole, an aperture almost in the shape of a capital S, is placed at the extremity of the snout, and occupies, therefore, the position of the nostrils in terrestrial animals. The mouth is huge, the jaw opening back almost to the eye. The under-jaw is narrow, and shorter than the upper, and possesses heavy and strong teeth which vary considerably in number in the specimens that have been examined; the average in the adults is about fifty-two. In the upper-jaw we find a series of conical cavities in which the teeth of the lower-jaw fit, and near them, or sometimes even in these depressions, a series of rudimentary teeth is detected. The teeth of the Sperm Whale are, for us, merely curiosities, but in the South Sea Islands they are articles of the highest value, being thought worthy of dedication to the idol deities, or at least placed as rare ornaments in the king's house. So great is the conventional value of these teeth, that several wars have arisen from the possession of a whale's tooth by an inferior and unfortunate chief who had discovered the rarity and meant to keep it.

The partly-hidden teeth of the upper-jaw are about three inches in length, but they hardly project more than half an inch through the soft parts in which they are imbedded. In preparing the skull of the *Spermaceti* Whale these teeth are apt to fall out together with the softer parts, as their attachment to the jawbone is very slight. Eight of these teeth have been found on each side of the jaw.

The enormous head is divided by a perpendicular wall into two chambers, which connect by several openings. The whole space is full of a liquid, oily substance, the so-called "*spermaceti*," which is also found in a canal running from the head to the tail, and in many small cavities scattered in the blubber, the bulk, however, being in the head. When the whale is killed, the head is cut off, a large hole cut in the top of it, and the liquid is baled out in buckets. It is then clear and oily, but after a few hours exposure to the air the *spermaceti* begins to separate, and is soon firm enough to be removed, and put in a different vessel. To prepare it for commercial purposes, a long process is required; it is melted several times, treated with a solution of potassa, and boiled in alcohol. It is then deposited in laminated crystals of a pearly-white hue. The amount of this substance obtained from a single

whale is sometimes very large: from a moderate-sized one twenty-four barrels of spermaceti and one hundred barrels of oil were procured. It is used in medicine, and in the preparation of candles.

The Sperm Whale in its movements resembles the Dolphins more than the Right Whales, and in speed nearly equals the Rorquals. When swimming quietly, it glides at the rate of three or four miles an hour under the surface of the water, but when excited, it rushes through the sea with violence, the strokes of its powerful tail sending the water in waves on every side. It is remarkable for assuming at times a perpendicular position, the head or tail just projecting above the water. When alarmed, it sinks straight to the bottom; when sporting, it raises first one, then the other pectoral fin above the surface, and leaps clear out of the sea, falling again with a splash that sends the foam mast-high, and can be seen for ten miles. These movements are usually attributed to the attacks of parasites; but this seems an erroneous supposition, as the Sperm Whale suffers less than others from such enemies. The members of a troop of Sperm Whales usually arrange themselves in a long line, dive and rise simultaneously, spout at the same moment, and at the same instant disappear beneath the water. When they are sleeping, they lie motionless, rocked by the swell, or keep the head out of water, so that to the spectator it seems the end of a huge timber, or the neck of an enormous bottle bobbing up and down. They breathe at very regular intervals, the spouting is directed forward, and is on an average only three feet high. Scammon pursued a sperm whale for five hours, and noticed that it regularly blew fifty-five times at intervals of ten seconds at each appearance, and then remained fifty-five minutes under water, going at the rate of three miles an hour. The sense of hearing of the sperm whales is dull, that of sight pretty good, that of touch or feeling excellent, as the skin seems provided with nerves which convey the slightest impression.

The sperm whales, very unlike the dolphins, avoid the neighborhood of vessels, and it often happens that when surprised, they are almost paralyzed with terror, and remain motionless. This is especially the case when a female is the first to be wounded, whereas if an old male is struck, the whole herd at once take flight.

Sometimes, however, a "large whale" will become belligerent, and is then a most fearful antagonist, using its tail and its huge jaws with equal effect. One of these animals has been known to drive its lower jaw



SPERM WHALE

entirely through the plankings of a stout whaling-boat, and another well-known individual destroyed nine boats in rapid succession. This formidable animal was at last killed, and in its carcass were found a whole armory of harpoons and spears belonging to different ships. Not only boats, but even ships have been sunk by the attacks of an infuriated "old bull," as the adult male is styled.

An American ship, the "Essex," was thus destroyed by the vengeful fury of a sperm whale. The story of the disaster is as follows: "The 'Essex,' Captain Pollard, sailed from Nantucket in August, 1819. Late in the fall, in latitude 40° of the South Pacific, a school of sperm whales was discovered, and three boats were manned and sent in pursuit. The mate's boat was struck by one of them, and he was obliged to return to the ship to repair damages. While he was thus engaged, a sperm whale, judged to be eighty-five feet long, broke water about twenty rods from the ship on her weather-bow. He was going at the rate of about three knots an hour, and the ship at nearly the same rate, when he struck the bows, just forward of the chains. The ship shook like a leaf; the whale dived and passed under the ship, grazing her keel, and then appeared at about the distance of a ship's length, lashing the sea with fins and tail as if suffering the most horrible agony. He was evidently hurt by the collision, and frantic with rage. In a few minutes he seemed to recover himself, and started with great speed directly across the vessel's course to windward. Meanwhile the hands on board discovered the ship to be gradually settling at the bows, and the pumps were rigged. While working at them, one of the men cried out, 'God have mercy! here he comes again!' The whale had turned at about one hundred rods from the ship, and was making for her with double his former speed, his pathway white with foam. Rushing head on, he struck her again at the bow, and the tremendous blow stove her in. The whale dived again and disappeared, the ship filled and fell over on her broadside in ten minutes from the first collision. After incredible sufferings, the survivors reached Ducie's Island, where three of the crew resolved to remain. The remainder, in three boats, made for Juan Fernandez; the mate's boat was taken up by the 'Indian' of London, ninety-three days after the catastrophe, with only three survivors. The captain's boat was fallen in with five days afterward by the 'Dauphin' of Nantucket, with only two survivors. Thus, out of a crew of twenty, only five survived to tell the sad tale."

Another American ship, the "Ann Alexander," was similarly destroyed, and two months after the sinking of the unfortunate vessel, the "Rebecca" captured a huge sperm whale which surprised the fishermen by offering no resistance. They found embedded in its carcass two harpoons marked "Ann Alexander," and discovered severe injuries in its head from a terrible wound in which fragments of ship's planking were projecting. A British ship, "Waterloo," was another victim to the fury of the sperm whale, and Scammon expresses his belief that many a ship which goes to the fishing and never returns, has been sunk by the animal it was engaged in pursuing to the death.

We have not yet mentioned one of the most curious products of the sperm whale, the strange substance called Ambergris. It is a light wax-like material of various colors, and greasy to the touch; it possesses a very agreeable smell, and becomes soft when heat is applied, boiling water reducing it to an oily fluid. It is used by perfumers for mixing with sundry oils and soaps. In ancient times, and down to the last century, it was employed in medicine as an anodyne and antispasmodic, but modern science rejects it from our pharmacopæia.

The origin of this substance for a long time baffled all inquirers; some imagined it to be the excrement of a bird, which, being melted by the heat of the sun and washed off by the waves, was then swallowed by whales, who returned it in the condition we find it. Others took it for a kind of wax or gum which distils from trees, and congeals in the sea. Many of the Orientals say it springs out of the sea; others, that it is a vegetable production issuing from the roots of trees; others, that it is made from honeycombs which had fallen from the rocks into the sea, and witnesses were brought forward to depose that they had found pieces half-ambergris, half-honeycomb, and even had taken honey from a piece, when it had been broken. As it was usually found on the shore, it obtained the name of amber, and to distinguish it from the genuine amber of the Baltic coast, it received the epithet of *gris* or "gray." Ambergris, therefore, means "gray amber." Amber, however, is a resinous substance, and we now know that ambergris is a morbid secretion found in the intestines of the sperm whale, a mass weighing fifty pounds having been discovered in a single whale. The value of this article is very variable, but is always costly, averaging five dollars the ounce.

The food of the sperm whale is mostly furnished by squids or cuttle-

fish, but when it approaches land it devours any small fish. The manner in which it feeds is, however, not ascertained. It is supposed that it drops its lower-jaw till it makes nearly a right-angle with the upper one, and then swims slowly along, its sharp teeth transfixing whatever comes in its way. The stories that it can devour seals or dolphins are unworthy of credence. It will take vegetable diet, and has been seen to swallow fruit drifting on the waves.

The Sperm Whale never passes the Cape of Good Hope, but does pass round Cape Horn.

THE BLACK-FISH.

The Black-Fish has been separated from the genus *Catodon* because, although it possesses the huge head and heavily-toothed jaw of the sperm whales, the spout-holes are removed from the extremity of the snout, and placed upon the middle of the top of the head. These spout-holes are separate, and covered with a common flap. The pectoral fins are moderate in size and triangular in form; the dorsal fin is long and sickle-shaped; the head exceeds one-fourth of the entire bulk.

GENUS PHYSETER.

The BLACK-FISH, *Physeter tursio* (Plate XXVII) the only species of the genus, is, when fully grown, of considerable dimensions, often measuring fifty to sixty feet in length.

The dimensions of one of these animals have been very accurately given by Sibbald.

In total length it measured between fifty-two and fifty-three feet, its girth at the largest part of the body was rather more than thirty-two feet, and as it lay on the ground the height of its back was twelve feet. The lower jaw was ten feet in length, and was furnished with forty-two teeth, twenty-one on each side. Each tooth was slightly sickle-shaped, and curved towards the throat. An equal number of cartilaginous sockets are placed in the upper jaw into which the conical teeth are received when the mouth is closed. The teeth in the middle of the jaw are larger and heavier than those of the front or base; some of them exceed nine inches in length, and weigh more than eighteen ounces when perfectly dried. The root of each tooth is hollow in the centre to

the depth of several inches, and is so deeply buried in the jaw, that the projecting portion of the largest tooth rarely exceeds three inches. The teeth range from seven to nine inches in length. These teeth are very white and polished, are conical in their shape, tolerably sharp while the animal is young, but become blunt as the creature increases in years and dimensions.

In Sibbald's specimen, from the tip of the snout to the eyes was a distance of twelve feet, and the upper part of the snout projected nearly five feet beyond the tip of the lower jaw. The eyes were remarkably small, about the size of those of the common haddock. As may be supposed from the popular name of this animal, the color of its skin is almost uniformly black. The throat is larger, in proportion, than that of other whales. One of these animals is said to have been thrown ashore at Nice, in the month of November, 1736; when the head was opened, it was found to contain spermaceti, which lay in a mass two feet in thickness in the usual locality.

This species is frequently seen on the coast of the Shetland Islands in summer.

GENUS COGIA.

The *two* species of this genus are both inhabitants of the Southern seas. They are considerably smaller than the rest of the family, and as in the dimensions of the head they resemble the dolphins, they are commonly known as the "Short-headed" Whales.

The methods of taking the Sperm Whales are identical with those already described as employed in the capture of the other whales, and the ships engaged are principally from the United States and Australia.



CHAPTER IV.

THE BEAKED WHALES AND THE NARWHALS.

THE FAMILY HYPEROODONTIDÆ—THE BEAKED WHALES—THE BOTTLE-NOSED WHALE—THE XIPHIUS—THE FAMILY MONODONTIDÆ—THE NARWHAL—ITS EXTRAORDINARY HORN—CONJECTURES AS TO ITS USE—FABLES RESPECTING IT—MEDICINAL PROPERTIES ATTRIBUTED TO IT—VALUE OF THE NARWHAL TO THE GREENLANDERS—SHIPS STRUCK BY IT.

THE family HYPEROODONTIDÆ consists of the Beaked Whales, which have no permanent teeth in the upper jaw. It is divided into *nine* genera or sub-genera, containing *twelve* species, nearly equally distributed between the Northern and Southern Hemispheres. Most of the genera consist of only one species.

GENUS HYPEROODON.

The *two* species embraced under this genus both inhabit the North Seas. The best known representative is

The BOTTLE-NOSED WHALE, *Hyperoodon bidens*, a powerfully-built creature of twenty to twenty-six feet in length. The head is like that of the dolphin, but the animal is longer, the body being thicker for the first half of its length, narrow towards the tail. The eye is small, and just behind the corner of the mouth; the ear is scarcely noticeable behind the eye; the spout-hole lies between the eyes, and is crescent-shaped; the fore-part of the muzzle is prolonged so as to form a beak, the pectoral fins, springing from the anterior third of the body, are narrow and abruptly rounded, the dorsal fin is small, low, and sickle-shaped, the tail is divided into two pointed flaps. From the centre of the under-jaw runs a short, deep fold of skin, the rest of the hide is smooth and shining, and of a dark color, becoming black on the back.

The Bottle-nosed Whales are confined to the Northern Arctic and

Northern Atlantic Oceans, but they occasionally migrate into more southern regions, and are, every year, found in the neighborhood of the Faroe Islands, and sometimes on the Scotch coasts, even entering the mouths of rivers. They are rare in the Greenland waters, but frequent at the entrance of Davis Straits. Their habits are little known, owing to their being so often confounded with the dolphins. When they blow, they send out a thin low spout four or five times in succession. Cuttle-fish and squids form their chief food.

The Bottle-nosed Whale is often stranded on the coasts of Europe. The earliest account of it we have is a description of one taken near Harwich in England, in 1717, and measuring fourteen feet. Hunter describes one caught above London Bridge in 1783, which was twenty-one feet in length, and he mentions the skull of one which must have been thirty feet in length.

GENUS XIPHIUS.

The *solitary* species of this genus is found in the Northern Atlantic.

The XIPHIUS, *Xiphius Sowerbiensis*, is so named after the well-known naturalist Sowerby, who figured and described the animal in the British Miscellany. His description was founded upon a specimen that was cast ashore upon the estate of Mr. J. Brodie, in Elginshire. The skull of this individual was preserved by Mr. Sowerby in his museum, and after his death it was placed by Dr. Buckland in the Anatomical Museum at Oxford. As it is so valuable a specimen, it has been industriously multiplied by means of plaster-casts, which have been distributed to various scientific institutions.

The length of the creature was sixteen feet, and its girth at the largest part of the body was eleven feet. The head is small, narrow, and pointed, and the lower-jaw is longer, blunter, and wider than the upper-jaw, so that when the mouth is closed, the lower-jaw receives the upper. In the upper-jaw there are two depressions corresponding with the teeth, and permitting the perfect closing of the mouth. The color of the animal is black on the upper surface and gray below, and is remarkable for the pellucid and satin-like character of the skin, which reflects the rays of the sun to a considerable distance. The body is marked like watered silk; this effect is produced by a vast number of

white streaks immediately below the skin, which are drawn irregularly over the whole body, and at a little distance appear as if they were made by means of some sharp instrument. Nothing is known of the habits of this curious animal, which is unknown to science, except by means of the specimen above-mentioned.

We may dismiss the remaining genera of the family with the remark that PETRORHYNCHUS and NEOXIPHIUS are found in the Mediterranean Sea, that BERARDIUS has been seen near New Zealand, and DOLICHODON at the Cape of Good Hope. The genus DIOPLODON in the Indian Ocean is a very remarkable creature, judging from its solitary species, *Dioploodon Schellensis*. The skull has two horn-like processes projecting from the snout; the vertebræ are enormous in comparison with the ribs, which are slender and short. The genus LAGONOCETUS inhabits the North Seas, and EPIODON the South American waters.

THE NARWHAL.

The family MONODONTIDÆ comprises *one* genus of only *one* species, but this is so remarkable and so peculiar as to fully justify the creation of a family for it.

GENUS MONODON.

The NARWHAL or SEA UNICORN, *Monodon monoceros* (Plate XXVIII), is distinguished from all other whales by the possession in the upper-jaw of two powerful teeth. As a rule, the tooth on the right-hand side is rudimentary, while the other attains a length of seven to nine feet. This curious weapon is placed perpendicularly in the jaw, is hollow within, and twisted spirally from right to left. In the females it is only slightly developed. The skull, too, is likewise unsymmetrical. The upper-arm and fore-arm are joined so as to preclude motion, the flipper consists of five fingers of four or three joints. The round head occupies one-seventh of the total length of the creature, the eyes are deep set, a little higher than the point of the snout, the ear is very small, the crescent-shaped blow-hole is between the eyes, in the centre of the forehead. From the blow-holes a tube leads to two large air-chambers. The dorsal fin is wanting, and only indicated by a fold of skin, the pectoral fins are short and oval, the tail forms two distinct flaps. The skin is soft, brilliant, and

like satin, and in the male it is marked in numerous irregularly shaped but usually long spots of a dark brown color, the rest of the skin being white or yellowish. These dark spots are densest on the back. Specimens, however, have been seen of a uniform white or gray color. The length of the Narwhal is on an average twelve to sixteen feet, but some have been found which measured nearly twenty feet.

The extraordinary weapon with which the Narwhal is armed, soon attracted attention, and provoked numerous speculations as to its use. The celebrated Albertus Magnus describes this animal as a fish which has a horn on its forehead by which it can pierce fishes, or even ships, but that the mercy of the Creator has made it so sluggish that escape from it is easy. Rochefort relates that the horn is used for attacks on other whales, and for boring through the ice. Fabricius conjectures that the Narwhal spits fish on this weapon, which it then holds up till the prey slips down within reach of its tongue. Scoresby agrees with those who regard the horn as an instrument for making breathing-holes in the ice. It is evident, however, that an apparatus necessary to enable the animal either to procure food or get fresh air would not be restricted to one sex. There can be no doubt that this horn, which is a distinguishing mark of sex, is, like the tusk of the boar, a weapon of offence.

In some rare instances the right tusk has been developed instead of the left, and it is supposed that if the developed tooth should be broken, the right tusk becomes vivified, and supplies the place of the damaged weapon. One remarkable case is known where both tusks were almost equally developed, being rather more than ten inches in length; and another example is recorded of a Narwhal which possessed two long tusks, the one being seven feet five inches in length, and the other seven feet. These tusks diverge slightly from each other, as their tips are thirteen inches asunder, though there is only an interval of two inches between their bases. Both these specimens were females. Sometimes the female Narwhal possesses a spear like her mate, but this is probably the effect of age, which in so many creatures, such as the domestic fowl, gives to the aged female the characteristics of the male. As both these double-tusked Narwhals were females, it may be probable that they owed their unusual weapons to some peculiarity in their structure, which prevented them from becoming mothers, and forced the innate energies to expend themselves in the development of tusks instead of the formation of offspring. The tusks of male swine and other animals,

the horns of male deer, the mane of male lions, and other similar structures, appear to be safety-valves to the vital energies, which in the one sex are occupied in the continual formation of successive offspring, and in the other find an outlet in the development of tooth, horn, and hair, according to the character of the animal. In all probability, the health of the animal would greatly suffer if the calcareous and other particles which are deposited in the tusk were forced to remain in the system instead of being harmlessly removed from it and placed upon its exterior.

The ivory of the Narwhal's tusk is remarkably good in quality, being hard and solid, capable of receiving a high polish, and possessing the property of retaining its whiteness for a very long period, so that a large Narwhal horn is of no inconsiderable commercial value. The throne of the kings of Denmark was made of this ivory; kings and emperors had their sceptres, and bishops their croziers fashioned from it. But the Narwhal's tusk in older days had a still greater renown for its medicinal virtues; it was regarded as the horn of the unicorn, capable of disarming all poisons. This antidotal potency was thought to be of vital service to the unicorn, which resides in the wilderness, among all kinds of loathsome beasts and poisonous reptiles, whose touch was death, and whose look was contamination. The springs and pools at which such monsters quenched their thirst were saturated with poison by their contact, and would pour a fiery death through the veins of any animal that partook of the same water. But the unicorn, by dipping the tip of his horn into the pool, neutralized the venom, and rendered the deadly waters harmless. This admirable quality of the unicorn-horn was a great recommendation in days when the poisoned chalice crept too frequently upon the festive board; and a king could receive no worthier present than a goblet formed from such valuable material. Charles the IX of France was very careful to put into his cup a piece of the Sea Unicorn's tooth. The Margraves of Baireuth kept one in their treasury, but reserved its benefits for members of their princely house alone. Under the influence of such a belief the most exaggerated price was set on a Narwhal's horn. One in the Elector of Saxony's possession in Dresden was valued in the sixteenth century at 100,000 dollars. As navigation became more general, the horn lost its value, and when in the beginning of the eighteenth century the "Greenland Company" sent several Narwhal horns to Moscow with a view to selling them to the Czar, the emperor's physician refused to buy them, as they were merely

fishes' teeth, not the horns of the unicorn. At present the only believers in the medicinal properties of the horn are the Chinese and Japanese.

The native Greenlanders hold the Narwhal in high estimation; for, independently of its value, it is welcomed on each succeeding year as the harbinger of the Greenland whale. It is, moreover, of the greatest service to the Greenlanders, for its long ivory tusk is admirably adapted for the manufacture of various household implements and of spear-heads, so that it is the sad fate of many a Narwhal to perish by means of the tooth that has been extracted from its near kinsman. It is easily killed, as it possesses no very great power of diving, and is soon tired out by means of inflated buoys which are attached to the harpoon, and offer a great resistance to the water. It seldom descends above two hundred fathoms below the surface, and when it again rises, is so fatigued that it is readily killed by a sharp spear. The oil which is extracted from the blubber is very delicate, but is not present in very great amount, as the coating of fatty substance is seldom more than three inches in depth. About half a ton of oil is obtained from a large specimen. The flesh is much prized by the natives, and is not only eaten in its fresh state, but is carefully dried and prepared over the fire.

The stories of the Narwhal destroying ships have some foundation in the experience of later navigators. The force of the tusk is terrific when urged with the impetus of the creature driving through the water at full speed, for the whole combined power of the weight and velocity of the animal is directed along the line of the tusk. A Narwhal has been known to strike a ship on the quarter, and to drive its tusk through the sheathing, and deeply into the timbers. The shock was probably fatal to the assailant, for the tooth was snapped by the sudden blow, remaining in the hole which it had made, and acting as a plug that effectually prevented the water from gaining admission into the vessel. This the author can verify from personal observation.



CHAPTER V.

THE DOLPHINS.

THE DELPHINIDÆ—THE SOOSOOK OR DOLPHIN OF THE GANGES—THE INIA OF THE AMAZON RIVER—THE TUCUXI—THE DOLPHINS PROPER—LEGENDS—SYMBOLS—THE COMMON DOLPHIN—THE WHITE-BEAKED DOLPHIN—THE BOTTLE-NOSED DOLPHIN.

THE family DELPHINIDÆ comprehends the Porpoises, Dolphins, and White Whales, all of which may be described as small fish-shaped whales with teeth in both jaws. The two breathing-holes are, as a rule, united together so as to form a single crescent-shaped aperture set transversely on the crown of the head: the body is usually elongated, the head small, the snout prominent and often pointed; a dorsal fin is usually present.

Members of the Dolphin family are found in all seas, and are the only Cetaceans which ascend high into rivers, or pass the greater part of their lives in them and the lakes which are connected with them. They are all social in a very high degree; many species indeed form very large bands, which traverse the seas in company for days and weeks together. The smaller species often form troops in alliance with some one or more of their kindred species, and pursue their quest for food in common. The liveliness of all members of the family, their sportiveness, and the absence of all dread of mankind have rendered them in all ages favorites of sailors and poets.

Nearly all the Delphinidæ swim with extraordinary skill and rapidity, and are thus well qualified to catch fish. They are the most terrible of sea-robbers, attacking even the huge whale and mastering it by their persevering courage. Their food usually consists of cephalopods, mollusca, crustacea, or radiata, but some feed on sea-weed, and will even eat fruit, which they pluck from the boughs which overhang rivers. They are all rapacious, greedy, and cruel. They consume whatever can be eaten; even the young of their own or allied species fall victims to their

gluttony; when one of a band is slain, the others at once fall on the body and tear it to pieces. During the pairing season the males fight desperately, and the slain rival is at once devoured. The females, after a pregnancy of ten months, bring forth one or two young ones, which they suckle for a long time, cherish with the utmost care, and defend against all dangers. It is conjectured that they grow slowly, and live long.

The Delphinidæ are less pursued by man than other Cetacea; their chief enemies are those of their own kindred. Their own impulsiveness leads to their destruction very frequently; they follow their prey with such fury, that they rush blindfold into shallow water, or on to the treacherous strand, where the fishers sometimes find them by dozens. When wounded to death they utter lamentable groans and sighs, which are usually accompanied by floods of tears.

As all members of the family exhibit the greatest uniformity in their habits and modes of life, we confine ourselves to a description of the most important genera. The family is divided by Carus into four sub-families and eight genera, but Dr. Gray distributes it into *twenty-four* genera and *one hundred* species.

GENUS PLATANISTA.

The name PLATANISTA is given by Pliny to a dolphin which he describes as living in the Ganges, and measuring twenty-three feet in length. The actual animal is much smaller, being only six feet long.

The SOOSOOK, *Platanista Gangetica*, has a slender body, remarkable for the curious shape of its beak, which is long, slender, compressed at the sides, and larger at the extremity than at the middle. It possesses one hundred and twenty teeth. It is a swift and powerful but sluggish animal, never caring to exert itself except in pursuit of its prey. Its color is grayish-black upon the back, white on the abdomen; the eye is extraordinarily small, being about one-eighth of an inch in diameter. The dorsal fin is indicated by a projection of the skin.

As far as is known, this remarkable dolphin is found only in the Ganges and its various arms. It often goes far up the country, but is usually found near the mouth. It is as social as the other dolphins, lives on fishes and aquatic animals, and is said to pluck the ears of rice or the fruits which bend over the stream. The natives pursue it for the sake of

its fat, which they regard as a sovereign cure for rheumatism and other diseases of like nature. Its flesh is used only as bait for other fishes.

GENUS INIA.

In 1819, Humboldt published his observations on a dolphin which frequents the fresh-water streams of South America, but we owe to the French naturalist, D'Orbigny, the first accurate description. This traveler was astonished to hear that there existed five hundred miles from the Atlantic Ocean a "fish" which he was compelled to recognize as a dolphin; he had considerable difficulty in procuring a specimen, but finally obtained one at Principe Dobeira, the frontier port of Brazil.

The INIA, *Inia Amazonica*, is called "Bufes" by the Spaniards, "Bonto" by the Brazilians, and "Inia" by the Indians. The breathing apparatus is placed far back on a line with the pectoral fin, the dorsal fin is very small, the mouth is cleft far back, the snout is prolonged into a narrow, round beak covered with stiff bristles, each jaw possesses about sixty-six teeth. The length of the body is from six to nine feet, the female being only half as large. The color of the back is a dull blue, passing into a rosy red beneath. There are considerable variations in color, and specimens have been seen entirely red, and entirely black.

As far as is known, the Inia is found in all the streams of South America between 10° and 17° south. It is common in the Orinoco and the Amazon and its tributaries. It differs from the Sea-Dolphins in its movements, which are slower and less lively; it comes more often to the surface to breathe, and usually forms only small societies. Schomburgk observed dolphins which he considered identical with the Inia in the rivers of Guiana; they were especially numerous during and just after the rainy season. "Very often six or eight of them appeared, keeping together in pairs, or swimming swift as an arrow just under the surface, or at other times diving up and down incessantly, thus displaying not only their pointed snout, but the greatest part of their body above the water. As soon as the head was above the surface, they snorted like horses, the water ejected from the blow-holes looked like fine rain, and gave a remarkable charm to the quiet landscape."

Bates, the explorer of the Amazons, asserts that there are three species of this genus. "From its mouth, for fifteen hundred miles upward, we heard continually, especially by night, one or other of these

varieties blowing or snorting, and the sounds contributed in no small degree to creating a feeling of sea-like extent."

The Inia always keeps near the surface, often projecting its beak-like snout for the purpose of swallowing its food. This food consists chiefly of small fishes, and of fruits that drop into the stream. The Inias are to be found most abundantly in the clear deep bays of the river, or where streams flow into it, these spots being the best for catching fish. They often annoy travelers on the banks by approaching when a fire is kindled; the crowds of dolphins blowing and snorting is often so great, that the stranger, if he desires to sleep, must put his light out.

The native Indians do not chase the Inia, less because they can make little or no use of it, than from peculiar views respecting its nature and being. Mysterious tales respecting the Inia pass from mouth to mouth. It is a seductive nymph who has the power of appearing in the form of a maiden of wondrous beauty and flowing locks to beguile young men from the paths of virtue. She walks by night through the streets of the village, and many a youth follows the siren to the banks of the stream. Enraptured he sinks into her arms, when with a yell of triumph she plunges with the lover whom she is clasping to her bosom into the fatal waters. The Inia is the Lorelei of the Amazons—no Indian kills it, no one uses its oil for his lamp, for the light cast by such oil causes blindness. Bates had great difficulty in overcoming the scruples of an Indian fisherman who procured a specimen for him. The poor man declared afterward that from the moment he killed the Inia, all good fortune had deserted him, and that his peace of mind had been destroyed forever by his yielding to the importunities of the naturalist.

GENUS STENO.

The TUCUXI, *Steno Tucuxi*, shares with the Inia the lower waters of the Amazon River. It can be distinguished from the latter by its method of rising and sinking in the water. It ascends to the surface in a horizontal position, so that its dorsal fin is the part first seen; it then breathes and sinks back, head foremost, into the water very gently, while the Inia rolls like a porpoise, displaying first its head, then respiring, and immediately plunging its head down so that by degrees the whole external line of its curved back and its dorsal fin become visible. Apart from its peculiar mode of respiring, the Tucuxi differs from the Inia by not keeping in pairs.

THE DOLPHINS.

No whale occupied the attention of ancient naturalists more than the Dolphin, no marine animal inspired the poets with brighter descriptions or more marvellous fables. According to them, it was a mild, familiar animal, sensible to music. Philautes, after being shipwrecked on the coast of Italy, had been saved by a dolphin. Arion, threatened with death by the sailors of the ship of which he was on board, having thrown himself into the sea, was picked up by a dolphin attracted by the sweet notes of his lyre, and conveyed safely into harbor on the animal's back. Apollo took the form of a dolphin when he conducted his colony to the Delphian shores. Neptune changed himself into a dolphin when he carried off Melanthus. And so this marvellous creature was, among the ancients, the object of religious worship. Neptune was adored at Sunium, under the form of the Cetacean dear to his friend; and the Delphian Apollo, honored at Delphi, had dolphins as his symbol. Pliny tells a pretty story of a boy who gained the affection of a dolphin by feeding it with bread: the grateful creature used to save the lad a long walk every day, by carrying him on his back to and from school, across the Lucrine Lake. When the boy died, the dolphin appeared at the accustomed spot, and when the lad never came, pined away and died. Pliny also affirms that a young dolphin never goes abroad without an older companion, and that dolphins have been seen carrying off a dead dolphin to save it from other fishes. The old German writer, Gessner, calls the dolphin "the king and regent of the seas and waters," adding that for this reason the heir to the throne of France is called the Dauphin, an erroneous but favorite explanation of the origin of the title.

The fables inherited from antiquity still exist near the borders of the Mediterranean Sea, and from these fables are derived many of our current symbols. Twisted round a trident the dolphin represents the liberty of commerce; placed round a tripod, it signified the college of fifteen priests who performed service at Rome in the Temple of Apollo; caressed by Neptune, it was the sign of a calm sea and the safety of sailors; arranged round an anchor, or placed above an ox with a human face, it indicated that mixture of quickness and slowness which is expressed by prudence. Modern artists still represent the dolphin in the manner adopted by the earliest Greek sculptors, the tail elevated, the head large, the mouth enormous.

The species of dolphins are very numerous. Gray enumerates *ten* species in the genus: they inhabit all the oceans, and possess the same general traits.

We must remember that in common language the name "dolphin" is applied to the Scomberoid fish *Coryphæna*, and this must not be confounded with any species of the *Delphinus* of the naturalists.

GENUS DELPHINUS.

The general characteristics of the genus may be summed up as follows: the head is small in proportion, and is prolonged into a beak-like snout equal in length to the rest of the head, the jaws are armed with an extraordinary number of teeth, the pectoral fins are lateral, the dorsal fin rises from the centre of the back, the tail is very large, and forms almost a complete crescent.

The DOLPHIN, *Delphinus Delphis* (Plate XXVII), attains on the average a length of six feet. The number of its teeth vary considerably; specimens have been found with the astonishing number of two hundred and twelve; these teeth are so arranged that those of the lower-jaw fit into the interstices of those in the upper-jaw; and are all sharply pointed and curved backward, thus enabling the dolphin to hold securely its slippery prey. All the seas of the Northern Hemisphere are inhabited by this Cetacean, and it is everywhere a favorite of the sailors. It loves to follow vessels, and however swift their speed is, it gambols around their bows as if they were stationary. Dolphins are seen in troops numbering from ten up to many hundred members, their companionship arising chiefly from community of interest in obtaining food. This consists of small fishes, such as herrings or sardines, and they chase with great eagerness the flying-fish. In fact, it is the attack of the dolphin that makes the bonito leap from its native element.

In old days, the flesh of the Dolphin was considered a luxury; and as the creature, in common with all the Cetaceans, was considered as belonging to the fishes, its flesh was a permitted diet upon fast-days, and was served at table with a sauce composed of bread-crumbs, vinegar, and sugar; now-a-days, however, the flesh of the dolphin has fallen entirely into disrepute as an article of diet. The formation of the Dolphin's brain is of such a nature that it indicates great intelligence on

the part of its possessor, and goes far toward confirming some of the current reports on this subject. It is said that dolphins have been tamed and taught to feed from the hand of their instructor, besides performing sundry feats at his bidding. Sailors still believe in its possessing a taste for music, and when they desire to harpoon one, are reported to whistle in concert, with a view of keeping the dolphin still till the iron can be thrown.

The Dolphin produces only one young one at a birth, and is a very tender and careful parent.

GENUS DELPHINAPTERUS.

The WHITE-BEAKED DOLPHIN, *Delphinapterus Peronii*, bears also the names of the RIGHT-WHALE PORPOISE and PERON'S DOLPHIN. It is the *only* species known, and can be distinguished by the white beak, abdomen, and pectoral fins, the rest of the body being black. It is a Southern variety, and confined to the Atlantic Ocean, between the opposite coasts of Africa and Brazil.

GENUS TURSIO.

This genus contains *seven* species, one of which has been found in Philadelphia harbor. They are all rarer than the ordinary dolphin.

The BOTTLE-NOSED DOLPHIN, *Tursio erebennus*, usually measures seven or eight feet in length; its back is deeply tinged with purple, but the abdomen is grayish-white. It is distinguished from the common dolphin by the projection of the lower jaw beyond the upper; the teeth never exceed one hundred in number. This species is sometimes called the "Blunt-toothed Dolphin," but the shape of the teeth which led to this appellation has been proved to be not the normal one; as skulls exist in which the teeth are as sharp as in the ordinary dolphin.



CHAPTER VI.

THE PORPOISES AND WHITE WHALES.

THE COMMON PORPOISE—THE GRAMPUS, OR GLADIATOR DOLPHIN—ITS DESTRUCTIVENESS—ITS NAME “THE THRESHER”—THE PILOT WHALE, OR CAAING WHALE, OR GRIND—MODE OF CAPTURING—THE WHITE WHALE—SPECIMENS EXHIBITED IN SHOWS.

SOME of the Cetacea which form the subject of this chapter are better and more widely known than any other, as many specimens are seen in every inlet or bay of our sea coast.

GENUS PHOCÆNA.

The members of this genus, which comprises *two* species, are distinguished from the dolphins by having the muzzle short and uniformly rounded, instead of ending like a beak. Their size varies from six to eight feet, the head is small, the body round and full anteriorly, but compressed toward the tail; the color is a black-brown, or black with a greenish or violet reflection, with pure white on the abdomen. The jaws are armed with about one hundred teeth.

The PORPOISE, *Phocæna communis* (Plate XXVII), is the most familiar of all the Dolphin fraternity. The name is a corruption from the French *Porcpoisson*, or “Swine-fish,” and it is curious to observe that while we borrow a name from the French language, the French fishermen adopt a name of German or Scandinavian origin, and style the animal *Marsouin*, or “Sea-swine.”

The true home of the Porpoise is the northern portion of the Atlantic Ocean, from Greenland to North Africa, the Baltic and the Mediterranean Seas included. In the Pacific it extends down to the latitude of the Japan Islands. It seems to undertake regular migrations, proceeding northward when summer comes, and seeking the south on the

approach of winter. The porpoises live in numerous troops, and attract attention by their merry gambols among the waves. The mackerel, the herring, and the salmon flee before these turbulent troops, which are sometimes so numerous that, at the moment when the individual creatures composing them come to the surface to breathe, they darken the surface of the ocean. One then sees their oily, blackish bodies shining on all sides. They may often be seen shooting over the surface of the sea in Indian file.

As might be presumed from the formidable array of sharp teeth with which the jaws are studded, and which are so arranged that the upper and lower sets interlock when the animal closes its mouth, the food of the Porpoise consists entirely of animal substances; its voracity is proverbial; and it is a declared enemy to the fisherman, as it seems to prefer to devour the most marketable kinds of fish. Alone of the Cetacea it prefers the waters near the coast to the high seas, and pursues its prey into shallow water, and up rivers. Even the salmon, with its enormous power of leaping, cannot escape. The Porpoise prefers places where the water is discolored. It swims not far below the surface, comes up for an instant to breathe, and then dives again, curving its body so sharply, that it seems to form a ball. It is very active before a storm, and gambols about as if it were delighted at the coming tempest. It was much easier to watch these creatures before our rivers and coasts were so frequented by steam vessels, for the porpoises will not approach them so nearly as they approach sailing vessels.

The female produces one or two young ones at a birth, and the new-born offspring are remarkable for their very great size, measuring nearly one-half the length of the parent. The mother has large quantities of milk of a saltish, fishy taste.

The skin of the Porpoise is well suited for tanning, and makes valuable leather. Beneath the skin is a layer of fat about an inch deep, which can be melted into a very fine and delicate oil. Its flesh was formerly highly valued, and was cooked with bread-crumbs and vinegar; but it is unpleasing to the eye, and is said to be coarse to the taste, although it graced the royal banquets of Queen Elizabeth. The Porpoise has often been caught and kept for some time in captivity. When alarmed, it utters continuous cries of a very distressing and plaintive kind, and sheds tears in profusion. It is not known how long it would live in a state of nature if unmolested.

GENUS GRAMPUS.

The characteristics of this genus are a rounded head, a convex forehead, conical teeth, and ovate pectoral fins. It contains *three* species, of which none are found in our American waters.

CUVIER'S GRAMPUS, *Grampus Cuvierii*, is of a bluish-black color above, dirty white below. It loses its upper teeth at an early period, and preserves only a few of its lower ones. It is distinguished from the *Orca gladiator*—the Grampus of English sailors—by the lower position of the dorsal fin.

GENUS ORCA.

Of the *four* species assigned to this genus, we need only mention two, both of which are commonly called Grampus, a word corrupted from the French *grand poisson*, "great fish."

The KILLER or GRAMPUS, *Orca gladiator*, is also called the "Gladiator Dolphin," and has obtained in the Northern seas the somewhat misleading name of "Sword-fish" from its large sabre-like dorsal fin, which it is erroneously supposed to use as a weapon. It attains a length of eighteen to twenty feet. It possesses forty-four teeth, strongly made and slightly curved. It is black on the upper part of the body, white on the abdomen and sides, with a white patch above and behind the eye.

Although it sometimes wanders into more southern regions, its favored home is near the coasts of Greenland and Spitzbergen, where it congregates in small herds. It is a very wolf in its constant hunger, and commits great havoc among the larger fish, such as the cod, the skate, and the halibut: at times it is said to make systematic attacks on seals, by startling them from their slumber as they lie sunning themselves on the rocks or ice, and seizing them as they plunge half-asleep into the sea. Even the smaller porpoises and dolphins fall victims to the Grampus, as has been proved by the discovery of their remains in the dissected stomach of one of these animals.

In ancient times the Grampus seems to have been seen in the Mediterranean Sea, as Pliny mentions a whale which had white streaks on the head; but at present it does not seem to penetrate the Straits of Gibraltar, although very common on the English and French coasts. A

Grampus was captured nearly opposite Greenwich Hospital in 1772, and was so swift and powerful, that after it had been struck with three harpoons, and covered with lance wounds, it twice dragged the boat from Blackwall to Greenwich, and once ran as far as Deptford, going at a rate of eight miles per hour against the tide. The struggles of the wounded animal were so formidable, that none of the boats could approach it. Several other specimens of this animal have been caught in the same river at different times, one being twenty-four feet in length, and another measuring more than thirty feet.

The Killer is not only the largest, but the boldest, most rapacious and voracious, most blood-thirsty and dreaded of all the Delphinidae. It deserves the title bestowed on it by Linnæus of "The Tyrant of the Whales," and exceeds even the shark in the devastation it creates wherever it appears. Its extraordinary voracity compels it to approach the coasts, but its favorite hunting-grounds are where the white whale is found. These robbers of the seas are also fond of amusing themselves by mobbing the Greenland whale, just as the little birds mob owls when they venture forth in the daytime, and they persecute it by leaping out of the water and striking it sharply with their tails as they descend. The Americans, in consequence, have called it by the name of Thresher, or Killer. Captain Scott relates that he has often seen the Thresher engaged in this strange combat. Scammon writes: "The attack of these wolves of the ocean on their gigantic prey was like that of a pack of dogs on a deer. Some hung on to the head of the whale, others attacked it from below, others seized it by the lips, and if it opened its mouth, tore its tongue. In 1858 I was eye-witness of a combat between three grampuses and a whale and her calf; the calf was three times the size of the largest grampus. The latter charged the whales alternately, and slew the young whale after a combat of an hour's duration. During the course of the struggle the strength of the mother was nearly exhausted, and she had received several severe wounds in the breast and on the lips." Even harpooned whales are attacked by this sea-murderer and dragged under water, in spite of all the fishermen can do to prevent it.

The CAPE KILLER, *Orca Capensis*, called also the "South Sea Grampus," is frequently noticed in the Pacific Ocean. They occur in herds, and their appearance is supposed to indicate the resorts of the sperm whales. They are less in size, but similar in other respects to the common grampus.

GENUS GLOBIOCEPHALUS.

The *fourteen* species comprehended under this genus are all distinguished by the globular aspect of the head, the sickle-formed pectoral fins, and the dorsal fin rising from the centre of the body. To the inhabitants of the Faroe and Orkney Islands, and to the dwellers in remote Iceland, the sea yields no more precious product than the animals we are about to describe.

The PILOT WHALE, *Globiocephalus deductor*, is known by many names. The one we have used is that of the British Museum Catalogue; but the names ROUND-HEADED PORPOISE, BOTTLE-HEAD, SOCIAL WHALE, HOWLING WHALE, and BLACK WHALE are given to it by English writers. The Scotch call it the CAAING WHALE. In Iceland and the Faroe Islands it is called GRIND. This species has long pectoral flippers and a black skin, the belly and throat being white; the teeth seldom exceed fifty in number. The males attain the size of eighteen to twenty feet, the former being perhaps more common.

More social than others of its kindred, the Pilot Whale is always found in troops varying in number from ten up to thousands, and led by some old experienced male whom the rest follow with the same docility or senselessness with which sheep follow their leader. On the appearance of a shoal, the sailors endeavor to get to seaward of their victims, and gradually closing upon them, drive them onwards by shouts and missiles to the shore. When one of them—the leader—is forced upon the beach, a curious scene of self-immolation is acted by the whole herd. They are then attacked by the whole assembled population of the neighborhood, who dispatch them by various means; the cries and struggles of the poor animals—some in, some out of the water—the shouts of the men, the bloody sea, combine to form a scene of no trifling interest. By such methods an entire shoal of seven hundred and eighty were captured at once at Sumburgh in Shetland; while there came ashore at Hvalfiord in Iceland no less than one thousand one hundred and ten, all of which were taken. Cuvier relates that some fishermen drove a cub-whale ashore on the coast of Brittany; its cries attracted the rest of the herd, all of which, seventy in number, were soon lying on the strand. The herd consisted of seven males and twelve young ones, all the others being adult females, many of which had their udders full of milk. They lived for some time; one old male did not die till the fifth day.

To the inhabitants of all the Northern islands this dolphin is invaluable; on the average, each one yields a barrel of oil; the flesh is eaten both salted and fresh; it is said to resemble coarse corned-beef; the fat has no taste; the skin is used for straps and rudder-lines, the ribs to fence in the fields, and the bladder as a receptacle for oil.

GENUS BELUGA.

The most remarkable characteristic of this genus, which contains *six* species, is the entire absence of a dorsal fin. The pectoral fins are oval, and placed in the first quarter of the total length of the body; the round head falls perpendicularly to the broad, short truncated muzzle; the jaws are provided with a few teeth, which fall out in age.

The WHITE WHALE, *Beluga Catodon* (Plate XXVIII), is an animal nearly akin to the Narwhal, but it is not provided with a tusk, and it has situated in the front-half only of the jaws some teeth which are conical, oblique, often truncated from attrition, and in the upper jaw not unfrequently disappearing. These teeth vary in number, but there is usually a row of nine above and eight below, occasionally one more or less. The color of the Beluga is wholly white, but the young are black. In length it rarely exceeds fifteen feet. According to Mr. R. Brown, this animal is, beyond all comparison, so far as its importance to the Greenlander and Eskimo are concerned, *the* Whale of Greenland. Like the Narwhal, it is indigenous; but it is only seen on the coast of Danish Greenland during the winter months, leaving the coast south of 72° north latitude in June, and roaming about at the head of Baffin Bay and the western shore of Davis Strait during the summer. In October it is seen to go west, not south; but in winter it can be observed, in company with the Narwhal, at the broken places in the ice. Its range may be said to be the same as that of the Narwhals; and during the summer months corresponds with that of the Right Whale, of which it is considered the precursor. It, however, wanders farther south than the Narwhal, being found as a regular denizen as far south as 63° north latitude, on the European coast, though on the opposite or American side of the Atlantic it reaches much farther south, being quite common in the St. Lawrence River. The Greenlanders, during the summer, kill great numbers of them, and preserve their oil and dry their flesh for winter use. Of this animal and the Narwhal, about five hundred are

yearly caught by the Greenlanders; but the majority of this number are Belugas. It feeds on crustaceans, fishes, and cuttles, and in the stomach is generally found sand. The Greenlanders often jocularly remark, in reference to this, that the *Kcellluak* takes in ballast. Great numbers are captured by means of nets at the entrance of fiords and inlets, or in the sounds between islands. The young are darker colored than the adult, and can at once be distinguished among the herds of the adults, which are of a pinky-white color. They are rarely seen far from land. The males and females go together in the herd, and do not separate. Their blast is not unmusical; and, when under the water, they emit a peculiar whistling sound, which might be mistaken for the call of a bird; on this account the seamen often term them "Sea-canaries." It is rarely that the regular whalers kill a Beluga, their swiftness and activity giving the fishers more trouble than the oil is worth.

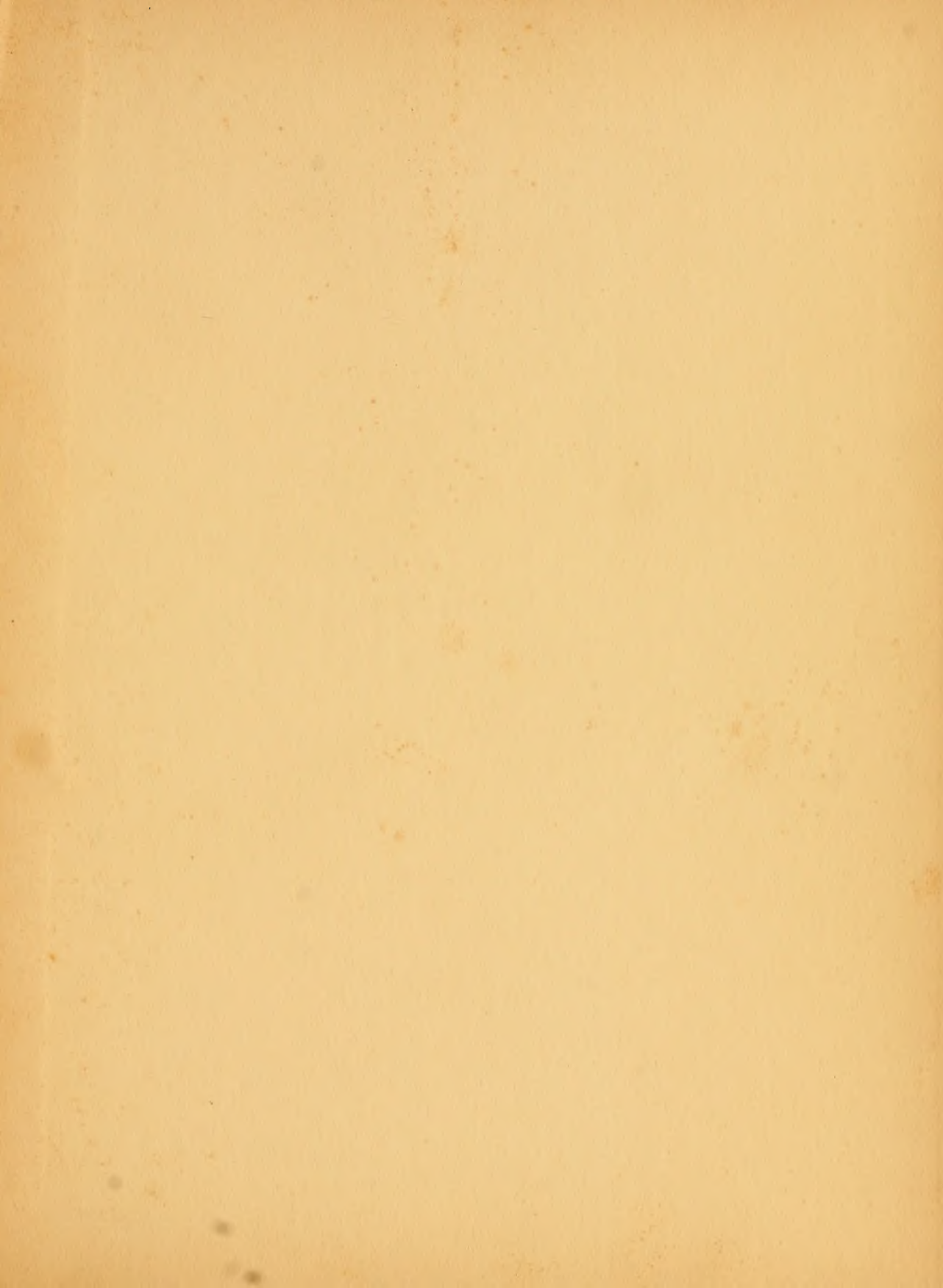
A White Whale was exhibited for some time at Barnum's Museum, New York. It was sufficiently well-trained to recognize its keeper, and would put its head out of the water to take its food. Since then numerous specimens have been seen in captivity both in New York and Boston. There was one at Coney Island in 1877, where it had the benefit of having a tank supplied with fresh sea-water.

The name *Beluga Canadensis* has been given to the White Whales which are taken at the mouth of the St. Lawrence River, but Gray considers them identical with *Beluga catodon*.

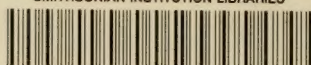
Most of the species of whales are as yet imperfectly known. Some idea of the number of the species may be formed from part of the evidence of Professor Owen given before a Parliamentary Commission. He said that in order to display his specimens of whales properly, the British Museum ought to have *fourteen* galleries, each *one mile* in length.







SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00055 4816